

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.

5281

Total Pages in this Submission

1 of 3

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application

Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

ELECTRONIC BOOK WITH CONNECTION TO WORLD WATCH LIVE

and invented by:

HENDRICKS, John S., et al.

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No.: 07/190,074; and

Which is a: 08/336,247; and 08/160,194; and PCT/US93/11606; and

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: 08/906,469; and 09/191,520; and 08/923,091

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 102 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
5281

Total Pages in this Submission
2 of 3

Application Elements (Continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 USC 113)

a. ☒ Formal Number of Sheets 59

b. ☐ Informal Number of Sheets _____

4. ☒ Oath or Declaration

a. ☐ Newly executed (original or copy) ☒ Unexecuted

b. ☐ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional application only)

c. ☐ With Power of Attorney ☒ Without Power of Attorney

d. ☐ DELETION OF INVENTOR(S)

Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (usable if Box 4b is checked)

The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. ☐ Computer Program in Microfiche (Appendix)

7. ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, all must be included)

a. ☐ Paper Copy

b. ☐ Computer Readable Copy (identical to computer copy)

c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☐ Assignment Papers (cover sheet & document(s))

9. ☐ 37 CFR 3.73(B) Statement (when there is an assignee)

10. ☐ English Translation Document (if applicable)

11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Acknowledgment postcard

14. ☐ Certificate of Mailing

☐ First Class ☐ Express Mail (Specify Label No.): _____

UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
5281

Total Pages in this Submission
3 of 3

Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. ☐ Additional Enclosures (please identify below):

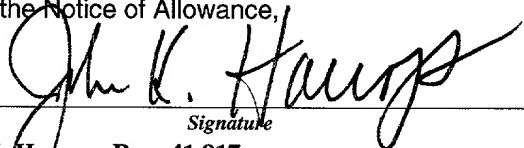
Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	51	- 20 =	31	x \$18.00	\$558.00
Indep. Claims	8	- 3 =	5	x \$78.00	\$390.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$690.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$1,638.00

- ☒ A check in the amount of **\$1,638.00** to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **04-1425** as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated:


Signature
John K. Harrop, Reg. 41,817
DORSEY & Whitney LLP
1001 Pennsylvania Avenue, N.W.
Suite 300 South
Washington, D.C. 20004
(202) 824-8800

cc:

ELECTRONIC BOOK CONNECTION TO WORLD WATCH LIVE

Related Applications

This application is a continuation-in-part of U.S. Application Serial No. 07/991,074 entitled TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM WITH MENU DRIVEN SUBSCRIBER ACCESS, filed December 9, 1992, U.S. Application Serial No. 08/336,247 entitled ELECTRONIC BOOK SELECTION AND DELIVERY SYSTEM, filed November 7, 1994, U.S. Application Serial No. 08/160,194 and PCT/US93/11606 entitled ADVANCED SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS, filed December 2, 1993, U.S. Application Serial No. 08/906,469 entitled REPROGRAMMABLE TERMINAL FOR SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY SYSTEM, filed August 5, 1997, U.S. Application Serial No. 09/191,520 entitled DIGITAL BROADCAST PROGRAM ORDERING, filed November 13, 1998 and U.S. Application Serial No. 08/923,091 entitled APPARATUS FOR VIDEO ACCESS AND CONTROL OVER COMPUTER NETWORK, INCLUDING IMAGE CORRECTION, filed September 4, 1997. These applications are incorporated by reference herein. Also incorporated by reference are co-pending U.S. Application Serial No. 09/237,827 entitled ELECTRONIC BOOK HAVING LIBRARY CATALOG MENU AND SEARCHING FEATURES, filed January 27, 1999; U.S. Application Serial No. 09/237,828 entitled ELECTRONIC BOOK ELECTRONIC LINKS, filed January 27, 1999; U.S. Application Serial No. 09/391,461 entitled VIDEO CONFERENCING WITH AN ELECTRONIC BOOK VIEWER, filed September 8, 1999; and U.S. Application Serial No. 09/289,956, entitled ELECTRONIC BOOK ALTERNATIVE DELIVERY METHODS, filed April 13, 1999.

Field Of The Invention

This invention relates to the distribution of audiovisual signals through communications networks such as computer networks and servers and their subsequent storage in and display on an electronic book reader. The invention has particular use with respect to global networks

1 such as the Internet and “World Wide Web”. The invention also relates to education.
2 Particularly, the invention provides an alternative to in-person classroom instruction.

3 Description Of Related Art

4 There is a constant desire to improve education and knowledge at all levels. It is
5 thought that true human progress can only be achieved if people’s understanding of each other
6 is improved and if people’s understanding of nature and the environment is improved.
7 Traditionally, education and knowledge have been obtained in schools from classroom
8 instruction and from the reading of books.

9 The disadvantage of current classroom instructional systems is that students must be
10 physically present in the classroom to participate in the educational process. Therefore,
11 students who are geographically displaced from the location of the classroom often cannot
12 attend class instruction as often or as timely as students who are nearby to the classroom.

13 The disadvantage of textbooks is that they are often not kept current with recent events
14 or technological changes. Textbooks are usually only updated on a yearly or less frequent
15 basis, while important changes may occur monthly or more frequently. Also, to save funds,
16 schools may not purchase new textbooks even though the textbooks have been updated.
17 Therefore, the new knowledge, although available, is not communicated to students.

18 Recently, audiovisual presentations have begun to be used in the field of education.
19 These systems may provide playback of a recording of a lecturer who provides a presentation
20 on an educational topic. For example, students may learn about math from watching a
21 videotape or television broadcast of a math professor’s lecture. Education can also occur on
22 a more informal basis. For example, specialty channels in the United States such as the
23 Discovery Channel® and The Learning Channel® (headquartered in Bethesda, Maryland,
24 U.S.A.) broadcast educational programming that both entertains and educates a diverse
25 viewership.

26 The disadvantage of these audiovisual systems is that they are not interactive. Students
27 are unable to ask questions, and the lecturer is unable to tailor the presentation of material to

1 the specific needs of the current student audience. Consequently, the needs of the students are
2 not met.

3 Cable and broadcast television are commonly known media which supply information
4 to large numbers of viewers equipped with receivers known as "television sets." By receiving
5 a broadcast, cablecast or satellite signal, users are able to view scenes from remote locations
6 and observe newsworthy events which occur far from the user's location. However,
7 conventional television is a one-way media in which users cannot communicate with each other
8 or the broadcaster.

9 Recently, the advent of the Internet, and the World Wide Web, in conjunction with the
10 proliferation of personal computers, has allowed people to exchange information and ideas on
11 a global and inexpensive basis. Generally speaking, the Internet is a large computer network
12 which connects host computers. Users with a computer, modem and telephone line commonly
13 call via telephone to connect with a host. The host, being in communication with other hosts
14 (connected to other users) is able to transfer information between users. The Internet is used,
15 for example, to transfer, data files, still images, sounds and messages between virtually any two
16 points in the world with telephone access.

17 The use of the Internet has increased dramatically since 1981, when approximately 300
18 host computers were linked together. In 1989, the number of linked host computers was fewer
19 than 90,000; but by 1993, over a million host computers were connected. Currently over 10
20 million host computers are linked (not including the personal computers people use to access
21 these hosts via modems) and as many as 40 million people around the world may have access
22 to the Internet medium. This number is expected to grow to 200 million by the end of 1999.

23 Users on the Internet are able to transfer text, graphics, and still pictures between
24 remote locations. Other types of information which can be transmitted include files containing
25 prerecorded sequences of images. To view these images, users download a large data file, and
26 after running appropriate software, see a sequence of images on the computer screen. These

1 images typically are not provided in real time, and are not viewable while the user is accessing
2 the Internet.

3 Therefore, even though the Internet is a two-way communication medium, it is not
4 currently being utilized to provide video information and audiovisual presentations. This is a
5 disadvantage, in that a large number of people have been accustomed to television audiovisual
6 presentations, and prefer an audio-video presentation to a textual or graphical presentation.

7 Summary Of Invention

8 The electronic book selection and delivery system is a new way to distribute books to
9 bookstores, public libraries, schools and consumers. The technological breakthroughs of this
10 invention provide a secure electronic system for both delivering selected books and receiving
11 payments. The system has an unusual combination of features that provides the consumer with
12 a daily use household appliance that has a high tech aura while being very practical, portable,
13 and easy to use.

14 An advantage of the system is that it eliminates the distribution of any physical object
15 such as a paper book or computer memory device from any book or text distribution system.
16 The purchase of a book becomes a PAY-PER-READ™ event avoiding the overhead,
17 “middle-men,” printing costs, and time delay associated with the current book distribution
18 system. Published material and text such as the President’s speech, a new law, a court decision
19 on abortion, or O.J. Simpson’s testimony can be made immediately available to the consumer
20 at a nominal fee. Alternatively, books may be made available free to the end use consumer,
21 subsidized by advertisers who sponsor books or embed advertising within the books.

22 The system is a novel combination of new technology involving the television, cable,
23 telephone, and computer industries. It utilizes high bandwidth data transmissions, strong
24 security measures, sophisticated digital switching, high resolution visual displays, novel controls,
25 and user friendly interface software.

26 The primary components of the text delivery system are the subsystem for preparing
27 the text for delivery and the subsystem for receiving and selecting text that was delivered. An

1 embodiment of the system includes additional components and optional features that enhance
2 the system. The system may be configured for use by bookstores, public libraries, schools and
3 consumers. In one embodiment, the system for consumer use is made up of four subsystems,
4 namely: (1) an operations center, (2) a distribution system, (3) a home subsystem including
5 reception, selection, viewing, transacting and transmission capabilities, and (4) a billing and
6 collection system. Alternative configurations of the system are defined to allow for a variety
7 of traditional and non-traditional delivery methods.

8 The operations center performs several primary functions: manipulating text data
9 (including receiving, formatting and storing of text data), security encoding of text, cataloging
10 of books, providing a messaging center capability, and performing uplink functions. In one
11 embodiment, the system delivers the text from the operations center to consumer homes by
12 inserting text data within analog video signals. The insertion of text is generally performed with
13 an encoder at an uplink site that is within or near the operations center. The system can use
14 several lines of the Vertical Blanking Interval (VBI), all the lines of the analog video signal, a
15 digital video signal or unused portions of bandwidth to transmit text data. Using the VBI
16 delivery method, the top ten or twenty book titles may be transmitted with video during normal
17 programming utilizing existing cable or broadcast transmission capability without disruption to
18 the subscriber's video reception. Using the entire video signal, thousands of books may be
19 transmitted within just one hour of air time. Nearly any analog or digital video or data
20 distribution system may be used to deliver the text data. The text data may also be transmitted
21 over other low and high speed signal paths including a telephone network (e.g., a public
22 switched telephone network) having a high speed connection such as a digital subscriber line
23 (DSL) connection and the Internet, for example.

24 The home subsystem performs at least four functions: connecting to the distribution
25 system, selecting text, storing text, and transacting through a communicating mechanism. The
26 components of the home subsystem may be configured in a variety of hardware configurations.
27 Each function may be performed by a separate component, the components may be integrated,

1 or the capability of existing cable set top converter boxes, computers, and televisions may be
2 utilized. A connector, library unit and viewer unit may be used. In one embodiment, the
3 connector portion of the home subsystem receives an analog video signal and strips or extracts
4 the text from the video. The home library stores the text signal, provides a user friendly
5 software interface to the system and processes the transactions at the consumer home. The
6 viewer provides a screen for viewing text or menus and novel user friendly controls. Alternative
7 embodiments are presented that support delivery of text using a variety of communication
8 mechanisms.

9 The viewing device may be a portable book shaped viewer which stores one or more
10 books for viewing and provides a screen for interacting with the home library unit. A high
11 resolution display is used to both read the books and to interact with the home library software.
12 In one embodiment, an optional phone connector or return-path cable connection initiates the
13 telephone calls and, with the aid of the library, transmits the necessary data to complete the
14 ordering and billing portion of the consumer transaction. Alternative embodiments are
15 presented that support ordering and billing using a variety of communication mechanisms. The
16 user friendly controls include a bookmark, current book and page turn button. The billing and
17 collection system performs transaction management, authorizations, collections and publisher
18 payments automatically.

19 A system similar to the system for consumer use may be used in bookstores, schools
20 and public libraries.

21 In one aspect of the invention, video is collected at a remote site. The term "video,"
22 as used herein, includes stereophonic or monophonic audio signals which may accompany a
23 video signal. Additionally, "video" is used broadly herein to include still images, groups of
24 related still images, animation, graphics, pictures, or other visual data, including textual data.
25 The remote video information may be obtained from a video cassette, CD ROMs, television
26 channels, one or more video cameras, or other well known sources. If video cameras are
27 used, they may be connected to a computer so that they are remotely controllable, or they may

1 be oriented such that a perception of control can be created for users. The video may relate
2 to remote sites of interest, such as a pyramid in Egypt, or the images may relate to an
3 educational lecture being conducted at a remote site.

4 The collected video may be transferred to a web site, either in compressed or
5 uncompressed form. The video may be physically transported or may be transmitted through
6 a communications medium to the web site.

7 The web site may contain a storage media that stores some or all of the video.
8 Additionally, the web site may pass camera control commands, if applicable, to the remotely
9 controlled cameras or may simulate the remote control of a camera. One function of the web
10 site is to pass video to a plurality of users, through a communication media such as the Internet,
11 in response to user selections. The video passed to the plurality of users may be live video
12 being fed to the web site, or may be stored video. A number of video servers may be used to
13 output the video to the users through the communications media, such as the Internet. The
14 video may be tailored by the web site for the particular user's hardware, including data
15 communication equipment, or memory size, i.e. the data rate matches the highest speed which
16 the user's equipment can handle.

17 Users receive and display the video sent from the web site. Many simultaneous video
18 pictures may be received. The quality and frame rate of the video is dependent on the user's
19 communications hardware. Users having electronic book viewers with high-speed modems
20 or cable modems may receive higher quality video. The users are able to send commands
21 and/or queries to the web site. The commands and queries are forwarded to remote locations
22 to control remote cameras or query remotely located instructors. Alternatively, the commands
23 may cause the web site to change from among many video signals with different camera angles
24 or locations (or to transmit a different portion of a wide angle image), causing the user to have
25 a perception of remote camera control. The user's commands may also cause a different
26 portion of a received wide angle image to be displayed, giving the user a perception of camera
27 control.

1 In addition to video, the web site provides information, such as graphics and text, which
2 may be related to the video or may be a separate program. This information may be
3 automatically supplied, or provided upon user request. Therefore, the user may be provided
4 with a comprehensive set of information concerning remote sites, remotely located documents,
5 or other information or data, enabling the user to be quickly educated about the remote site of
6 interest.

7 Brief Description Of Drawings

8 Figure 1a is a block diagram of the primary components of an electronic book selection
9 and delivery system.

10 Figure 1b is a block diagram of an electronic book selection and delivery system that
11 uses a composite video signal.

12 Figure 2 is a schematic showing an overview of the electronic book selection and
13 delivery system.

14 Figure 3 is a schematic of a delivery plan for the electronic book selection and delivery
15 system.

16 Figure 4 is a block diagram of the operations center.

17 Figure 5a is a flow diagram of processing at the operations center and uplink.

18 Figure 5b is a block diagram of a hardware configuration for an uplink site.

19 Figure 6a is a block diagram of a hardware configuration for a four component home
20 subsystem.

21 Figure 6b is a schematic of a two unit home subsystem.

22 Figure 7 is a flow diagram of processes performed by a video connector.

23 Figure 8 is a block diagram for an example of a library unit.

24 Figure 9 is a flow diagram of processes performed by a library unit on the received
25 data stream.

26 Figure 10 is a flow diagram of processes performed by a library unit on information
27 requests from a viewer.

Figure 11 is a block diagram showing the components for an example of a viewer.

Figure 12 is a flow diagram of processes performed by a viewer on an information request from a subscriber.

Figure 13 is a chart depicting a menu structure and sequencing of menus in a menu system.

Figure 14a is a schematic of an introductory menu.

Figure 14b is a schematic showing an example of a main menu.

Figures 14c, 14d, 14e, 14f, 14g, 14h, 14i and 14j are schematics showing examples of submenus.

Figure 15 is a schematic diagram of an electronic book system for a bookstore or public library.

Figure 16a and Figure 16b are schematics of hardware modifications or upgrades to a set top converter.

Figure 17 is a schematic showing a set top terminal that includes a data receiver and data transmitter.

Figure 18a is a schematic of a book-on-demand system.

Figure 18b is a schematic of an operations center supporting a book-on-demand system.

Figure 19 is a diagram depicting components used for delivery of electronic books over the Internet.

Figure 20 is a schematic of a page of an electronic book having electronic links;

Figure 21 is a schematic of a page of an electronic book with the electronic links shown;

Figure 22 is a schematic of a show links submenu;

Figure 23 is an example of links in an electronic book;

Figure 24 is a block diagram of an embodiment of the invention where remote video is provided to a web server by videocassette and by ordinary television.

1 Figure 25 is a block diagram of an embodiment of the invention where remote video
2 is provided by remotely located cameras and a communication network carries the video to
3 the web server.

4 Figures 26a and 26b are a block diagrams of an embodiment of the invention using the
5 embodiments of Figures 24 and 25 with remotely controllable cameras.

6 Figure 27 shows remote cameras positioned around a building for perceived camera
7 control.

8 Figures 28a - 28B show video images from specific cameras shown in Figure 27.

9 Figure 29 shows remote cameras deployed to follow a parade route.

10 Figures 30a and 30b show remotely controlled cameras at a remote location.

11 Figures 31a and 31b show a single remote camera at a remote location, where the
12 camera has a 180 degree spherical (or other wide angle) lens.

13 Figures 32a and 32b are block diagrams of a server platform.

14 Figure 33 is a block diagram of communications paths from the server site to remote
15 users.

16 Figure 34 shows a home page in accordance with an embodiment of the invention.

17 Figure 35 shows a "society" page in accordance with another embodiment of the
18 invention.

19 Figure 36 shows a "map" page of remote camera locations throughout the world.

20 Figure 37 shows a "watch" page containing live video feeds from five remote cameras.

21 Figure 38 shows a page directed to determining the user's data rate.

22 Figure 39 shows a page of an interactive lecture.

23 Figures 40 and 41 show pages of an embodiment of the invention that combines live
24 video, prestored video, graphics, and interactive questions.

25 Figure 42 shows a flow diagram of a method of automatically monitoring and panning
26 an area using perceived camera control.

1 Figure 43 is an exemplary screen display of the present invention, showing video and
2 also showing video data.

3 Detailed Description Of Invention

4 Figure 1a shows an electronic book distribution system 100 that may be used for
5 distributing an electronic book. A content provider 110 may publish hard copy versions of
6 books or other printed media including newspapers, magazines, and product catalogs, for
7 example. The content provider 110 may convert printed materials to an electronic format and
8 provide the electronic formatted materials to a distribution point, or center 120, over uplink
9 path 115. The uplink path 115 may be a wired or a wireless path. The uplink path 115 may
10 be a telecommunications network, for example. The uplink path 115 may be a satellite relay
11 path or a wireless telephone path. The uplink path 115 may involve providing electronic books
12 to the distribution center on a fixed media, such as a CD-ROM, for example.

13 In Figure 1a, the content provider 110 and the distribution center 120 are shown as
14 separate components of the electronic book distribution system 100. However, the content
15 provider 110 and the distribution center 120 may be co-located.

16 The distribution center 120 may convert printed matter into an electronic format.
17 Alternately, the distribution center 120 may receive electronic files from an outside source, such
18 as the content provider 110. The distribution center 120 may process and store electronic
19 books.

20 The distribution center 120 distributes electronic books. The distribution may be, for
21 example, over distribution path 125, distribution network 130, and distribution path 135 to an
22 electronic book subsystem or terminal 140, which may include an electronic book viewer (not
23 shown). The terminal may also be a television, a set top terminal, a personal computer, or
24 similar device. An apparatus and method for distributing electronic books is disclosed in
25 greater detail later. The distribution network 130 may be an electronic book store, an Internet
26 web site, a wired or wireless telecommunications network, an intranet, a radio program delivery
27 system, a television program delivery system, including cable television, satellite television

1 broadcast, and over-the-air broadcast, for example. The electronic book distribution network
2 130 could include direct delivery through a mail delivery system of electronic books on a fixed
3 media, such as a CD-ROM, for example.

4 Figure 1b shows components of an electronic book distribution system 170 using a
5 television program delivery system to distribute electronic books.

6 In the embodiment shown in Figure 1b, the components of the electronic book
7 selection and delivery system 170 are an encoder 174, a video distribution system 178, a
8 connector 182, and a text selector 186. The encoder 174 places textual data on a video signal
9 to form a composite video signal. Although the composite signal may contain only textual data,
10 it usually carries both video and textual data. A variety of equipment and methods may be used
11 to encode text data onto a video signal. The video distribution system 178 distributes the
12 composite video signal from the single point of the encoder 174 to multiple locations, which
13 have connectors 182. The connector 182 receives the digital or analog video signal from the
14 video distribution system 178 and separates, strips or extracts the text data from the composite
15 video signal. If necessary, the extracted text data is converted into a digital bit stream. The text
16 selector 186 works in connection with the connector 182 to select text.

17 Using the connector 182 and text selector 186 combination, various methods of
18 selecting and retrieving desired text from a composite or video signal are possible. Text may
19 be preselected, selected as received or selected after being received and stored. One method
20 is for the connector 182 to strip or extract all the text from the video signal and have the text
21 selector 186 screen all the text as received from the connector 182. The text selector 186 only
22 stores text in long term or permanent memory if the text passes a screening process described
23 below.

24 Figure 2 shows another embodiment of an electronic book selection and delivery
25 system 200. The delivery system 200 includes: an operations center 250 including an uplink
26 site 254, a video distribution system 208, an electronic book device, or home system 258
27 including a video connector 212, a library 262, a viewer 266, and a phone connector 270,

1 telephone system 274, an Internet web site 279 and a billing and collection system 278. Also
2 as shown in Figure 2, the home system 258 may include connections to a television 259 and
3 a personal computer 261 may be used to display menu screens, electronic books, electronic
4 files, or any other information associated with the electronic book delivery system 200. In
5 addition, the television 259 and the personal computer 261 may provide control functions that
6 replicate and supplement those of the viewer 266.

7 The operations center 250 receives textual material from outside sources 282 such as
8 publishers, newspapers, and on-line services. Alternately, the outside sources may maintain
9 electronic books at the Internet web site 279. The outside sources 282 may convert textual
10 and graphical material to digital format, or may contract with another vendor to provide this
11 service. The operations center 250 may receive the textual and graphical material in various
12 digital formats and may convert the textual material to a standard compressed format for
13 storage. In so doing, the operations center 250 may create a pool of textual material that is
14 available to be delivered to the home system 258. The textual material may be grouped by
15 books or titles for easy access.

16 As used herein, "book" means textual, graphical or video information. Such
17 information may be contained in any novels, encyclopedias, articles, magazines, newspapers,
18 catalogues, periodicals, or manuals or any portion or section of the above. The information
19 may also be provided as a video clip, for example. The term "title" may represent the actual
20 title assigned to a book, a video program, or any other designation indicating a particular group,
21 portion, or category of textual information. The title may refer to a series of related textual,
22 video or graphical information, a grouping of textual, video or graphical information, or a
23 portion of textual, video or graphical information. For example, "Latest Harlequin Romance",
24 "Four Child Reading Books (Ages 10-12)," "Encyclopedia 'BRITANNICA'™," "President's
25 Speech," "Instruction Manual," "Schedule of 4th of July Events," "Pet Handbooks," "Roe v.
26 Wade," and "The Joy of Cooking," are suitable titles. Also, the title may be a graphical symbol
27 or icon. Thus, a picture of a wrench may be a title for a repair book, a picture of a computer

1 a title for a computer book, a graphical symbol of a telephone a title for a telephone book, a
2 drawing of a dagger a title for a mystery book, a picture of a bat and ball a title for a sports
3 book, and a picture of tickertape a title for a business book.

4 The operations center 250 includes the uplink site 254 for placing the text or other
5 information onto a telecommunications signal and sending the telecommunications signal into
6 a distribution system. The uplink site 254 may include an encoder 204 (not shown in Figure
7 2) to encode the text onto the telecommunications signal.

8 Many analog and digital video distribution systems may be used with the electronic
9 book delivery system 200, such as cable television distribution systems, broadcast television
10 distribution systems, video distributed over telephone systems, direct satellite broadcast
11 distribution systems, and other wire and wireless video distribution systems. Nearly any
12 distribution system which can deliver a telecommunications signal, including a video signal, will
13 work with the electronic book delivery system 200. It is also possible to distribute the
14 electronic book without using a telecommunications signal as described in the embodiments
15 presented in Section VII below.

16 The home system 258 performs five functions: (1) connecting with a video distribution
17 system; (2) selecting data; (3) storing data; (4) displaying data; and (5) handling transactions.
18 An important optional function of the home system 258 is communicating using, in one
19 embodiment, a telephone communication system 274. The home system 258 may be made up
20 of four parts: a video connector 212 or similar type of connector for connecting with the
21 distribution system 208, a library 262 for storing and processing, a viewer 266 for viewing
22 menus and text and a telephone connector 270 for connecting with a telephone communications
23 system 274. Additional embodiments are presented in Section VII that address alternative
24 communication mechanisms.

25 The billing and collection system 278 may be co-located with the operations center 250
26 or located remote from the operations center 250. The billing and collection system 278 may
27 be in communication with the home system 258 using telephone-type communication systems

1 (for example 274). Any of a number of communication systems as presented in Section VII,
2 such as a cellular system or the Internet, will operate with the billing and collection system 278.
3 The billing and collection system 278 records the electronic books or video, or portions of text
4 or video that are selected or ordered by the subscriber. The collection system will charge a
5 subscriber's credit account or bill the subscriber. In addition, the billing and collection system
6 278 may monitor that amount due to publishers or other outside sources 282 who have
7 provided textual data or other services such as air time to enable the text delivery system 200
8 to operate.

9 Also shown in Figure 2 is an intranet 279'. The intranet 279' may be used as a part
10 of a private distribution network for distributing and circulating electronic books. For example,
11 a university library may use the intranet 279' to circulate electronic books to university students
12 and professors.

13 Figure 3 is an expanded overview of a delivery plan 301 for the electronic book
14 delivery system 200. It is a comprehensive delivery plan 301 to support various types of users
15 and various billing systems. Figure 3 shows that publishers 282 may provide text transfer 302
16 to the operations center 250' and receive payments 306 from the billing and collection system
17 278'. A separate channel uplink site 254' is shown in this configuration receiving data 310
18 from the operations center 250'. The operations center 250' has three separate sections (318,
19 322, 326) one for text receiving, formatting and re-entry 318, a second for security encoding
20 322 and a third section for catalog and messaging center functions 326.

21 The collection and billing system 278' shown has two sections (330, 334) one for
22 transaction management, authorizations and publisher payments 330, and the other for
23 customer service 334. The customer service section 334 provides for data entry and access
24 to customer account information. Transaction accounting information 338 is supplied to credit
25 card companies 342 by the transaction management section 330 of the billing and collection
26 system 278'. The credit card companies 342 provide billing 346 to customers either
27 electronically or by mail.

1 Methods for communicating between the subscriber base 348 and the billing and
2 collection system 278' include: by telephone switching 350 alone, cellular switching 354 and
3 telephone switching 350 combined, and by use of the cable system 358 and the telephone
4 switching 350. The system shown supports both one-way 362 and two-way cable
5 communication 366 with subscribers. Additional communication methods are presented in
6 Section VII. Public libraries and schools 370 as well as bookstores 374 may use the delivery
7 system 301.

8 Public libraries and schools 370 could have a modified system to allow the viewer to
9 be checked-out or borrowed while bookstores 374 would rent or sell the viewer and sell
10 electronic book data. The bookstores 374 as well as the public libraries and schools 370 may
11 be serviced by cable 378. Optional direct broadcast systems (DBS) 382 can also be used
12 with the system 200.

13 I. The Operations Center

14 Figure 4 is a schematic of the operations center 250, which includes the uplink 254.
15 The operations center 250 may gather text or books by receiving, formatting, storing, and
16 encoding. A data stream 302 containing text may be received at the operations center 250 by
17 a data receiver 402. The data receiver 402 is under the control of a processor 404. After
18 reception, the data stream is formatted using digital logic for formatting 406 which is also under
19 the control of the processor 404. If any additional text is generated at the operations center
20 250 locally for insertion into the distributed signal, the text generation is handled through text
21 generator hardware 410, which may include a data receiver and a keyboard (not shown).
22 Following processing by the text generator 410, the additional text can be added to the text
23 received by the combining hardware 414 that includes digital logic circuitry (not shown).

24 The processing at the operations center 250 is controlled by a processor 404, which
25 uses an instruction memory 416. The processor 404 and instruction memory 416 may be
26 supplied by a personal computer or mini-computer, for example. To perform the catalog and

1 messaging functions, the operations center 250 uses a catalog and message memory 420 and
2 the text generator 410 if necessary.

3 The data stream of text, catalog and messages may be encoded by security module
4 encoding 424 prior to being sent to the uplink module 254. Various encoding techniques may
5 be used by the security encoding module 424 such as the commercial derivative of NSA's
6 encryption algorithm (Data Encryption System (DES)) and General Instrument's DigiCipher II.
7 Following encoding, the encoded text may be stored in text memory 428 prior to being sent
8 to the uplink 254. A first-in-first-out text memory arrangement may be used under the control
9 of the processor 404. Various types of memory may be used for the text memory 428
10 including RAM. The operations center 250 may use file server technology for the text memory
11 428 to catalog and spool books for transmission as is described below. The operations center
12 250 may also store the electronic book as compressed data files.

13 In an embodiment, to transmit textual data, the distribution system 208 (see Figure 2)
14 may use high bandwidth transmission techniques such as those defined by the North American
15 Broadcast Teletext Standard (NABTS) and the World System Teletext (WST) standard.
16 Using the WST format (where each line of the Vertical Blanking Interval contains 266 data
17 bits), a four hundred page book, for example, may be transmitted during regular television
18 programming using four lines of the Vertical Blanking Interval at a rate of approximately one
19 book every 1.6 minutes (63,840 bits per second). Alternatively, books may be transmitted
20 over a dedicated channel, which interrupts programming so that 246 lines of video can be used
21 to transmit approximately 2,250 books every hour (3.9 Mbits per second). A teletext type
22 format is the simplest but possibly the slowest text format to use with the electronic book
23 delivery system 200. In either event, an encoder 204 may be used at an uplink site 254 to
24 insert textual data into the analog video signal. In many other respects, the delivery of the
25 textual information may be completed using an existing cable television plant and equipment.
26 Alternative transmit formats and delivery systems are presented in Section VII.

1 Figure 5a is a flowchart of steps involved in processing text from the publisher or
2 provider 282 that may occur at the operations center 250. As shown in block 500, the
3 publisher 282 processes data files of text for books, compresses, encrypts and sends the data
4 files to the operations center 250 or uplink 254. Text files for books may be sent one book
5 at a time. As shown in block 504, the uplink 254 or operations center 250 receives and
6 processes the data stream from the publisher 282. Generally, part of this processing includes
7 encryption and error correction. Text files may be delivered for receipt by multiple home
8 subsystems simultaneously, or to a specific individual home subsystem.

9 In Figure 5a, the electronic books are distributed to consumers using a video
10 distribution system such as a cable television system. However, the electronic books may also
11 be packaged as data packets and distributed over other telecommunications networks such as
12 a digital wireless telephone network, for example.

13 In one embodiment, as shown in block 508, files are broken into smaller packets of
14 information. Header information is added to the packets. The bit stream is converted from a
15 serial digital bit stream to an analog bit stream that is compatible with an NTSC video signal.
16 Block 512 shows the switching of analog data into the video lines of a video signal. The analog
17 data may be placed either in the VBI or the active video lines. In some instances, unused
18 portions of bandwidth (such as 5-40 MHZ, 70-75 MHZ, 100-109 MHZ or other guard
19 bands) may be used instead of the video lines. Alternate transmission methods are presented
20 in Section VII.

21 Figure 5b is an example of a hardware configuration to perform some of the functions
22 for blocks 508 and 512. A video feed 516 is received and processed through a sync stripper
23 520. The stripped sync signal 532 is used by the digital logic control 524. The digital logic
24 control 524 receives the sync signal 532 and a serial digital bit stream 528 for processing. The
25 digital logic control 524 passes the serial digital bit stream to the Digital to Analog converter
26 536 and outputs a control signal 540 for the video switch 544. The video switch 544 integrates

1 the video feed 516 and analog data stream 548 into a video feed with analog data signal
2 inserted 552.

3 As an alternative to cable, broadcast or other television delivery methods, the public
4 telephone system may be used to transmit books to the subscribers. An average book would
5 take about 7 minutes to transmit over the public telephone system. Using the telephone system,
6 it is not necessary to combine video and text into a composite signal. In most other respects,
7 the operations center would remain similar whether text delivery was by telephone or cable.
8 File server technology (such as that described in U.S. Patent No. 5,262,875, entitled
9 AUDIO/VIDEO FILE SERVER INCLUDING DECOMPRESSION/PLAYBACK MEANS, issued to Mincer,
10 et al., and, U.S. Patent No. 5,218,695, entitled FILE SERVER SYSTEM HAVING HIGH-SPEED
11 WRITE EXECUTION, issued to Noveck, et al., incorporated herein by reference) may be used
12 at the operation center with a telephone system text delivery method.

13 As another alternative to cable, television, and telephone system delivery, the public
14 telephone system may be used to provide access to the Internet, where the Internet web site
15 279 may be accessed. Electronic books may be ordered, paid for, and delivered directly from
16 the Internet web site 279 over the telephone system.

17 When a wireless telephone network is used to distribute electronic books, or otherwise
18 communicate with the home system 258, the home system may receive data using any one or
19 more standard protocols including time division multiple access (TDMA), code division multiple
20 access (CDMA), Global Systems for Mobile Communications (GSM) and Advanced Mobile
21 Telephone System (AMPS) protocols.

22 In any delivery system using the telephone system, individual subscribers may increase
23 the electronic book deliver rate by incorporating high speed modems or other communications
24 devices such as an Integrated Services Digital Network (ISDN) connector, or by use of a
25 Digital Subscriber Line (DSL).

II. The Home Subsystem

The hardware configuration for a four component home system 258 is shown in Figure 6a. Figure 6b shows a hardware configuration for a two component home subsystem. The home system 258 performs several functions, such as receiving data and video transmissions, stripping (or extracting) the data from the video signal, screening and storing the data, providing user friendly interface controls and software, displaying menus and text, processing transactions, initiating telephone calls and transmitting billing data. Various hardware configurations may be utilized to achieve the desired functions of the home system 258. For example, as shown in figure 6b, the home system 258 can be configured to utilize the reception and channel tuning capability of the current installed subscriber base of cable converter boxes and televisions 601 and networked computers. The home system 258 can also be designed as an advanced set top terminal converter box with menu generation capability, electronic memory and a telephone modem as described in section V below. Alternatively, the home system 258 can be configured to support alternate delivery and ordering methods as described in Section VII.

The electronic components, which make up the home system 258 can be arranged in a variety of ways. In the four unit subsystem of figure 6a the viewer 266 and library 262 are wired together while the remaining components communicate through RF transceivers 604. In a simple version of the home system 258 there are only two units, a library 262 and a viewer 266. Figure 6b shows a two unit home system 258 with certain optional features.

The viewer 266 is generally equipped with a high resolution viewing area 602, digital logic (including a key 605, security 606, and a microprocessor 621), video graphics control and memory 607, power supply circuitry 602 (not shown), an optional battery 603 and an optional RF transceiver 604. In a two unit arrangement, the library 262 contains the connector function to the electronic book distribution system 208, connector function to a public telephone communications system, and memory 600 (which may be removable and portable 600'). More specifically, the library 262 would include data stripping functions 617, digital

1 logic 609, memory storage 600, power circuitry 610, optional connections 611 (including
2 cellular or PCN 611'), optional battery (not shown), optional tuner module 613 and an optional
3 RF transceiver 604. The connector 212 and the public telephone system connection 270, as
4 well as the removable portable memory unit 600 of the library 262 may be broken out into
5 separate components. (Figure 6b shows a removable portable hard disk memory 600' with
6 removable cartridges 614.) Finally, the home system 258 may include an attached keyboard
7 267 or a wireless keyboard 268. Both the attached keyboard 267 and the wireless keyboard
8 268 may be used to communicate with the viewer 266 (not shown) or the library unit 262. The
9 wireless keyboard 268 may communicate using radio frequency (RF) signaling, for example.

10 In an alternate arrangement, all functions of the home system 258 may be incorporated
11 into a single unit. The functions of the library 262, for example, may be carried out by a card
12 or chipset in the viewer 266. All the communications devices needed to couple the home
13 system 258 to various telecommunications networks may also be incorporated into the viewer.
14 All interfaces between the home system 258 and the subscriber may be included with the
15 viewer 266. In this embodiment, the viewer 266 may include a communication device for
16 receiving inputs from a separate keyboard. The viewer 266 may also include a built-in video
17 camera 608" that may be used to transmit images of the subscriber. Using the transceiver 608,
18 the camera 608" and the speaker/microphone 608', the subscriber may use the viewer 266
19 for video conferencing, for example.

20 Therefore, the home system 258 may have as many as five separate components,
21 which communicate with each other. The two, three, four or five separate components which
22 make up the home subsystem can communicate with each other in a variety of ways, including
23 hardwired connection 615, RF transceiver 604 and other wireless methods.

24 RF communications may be used in the home, allowing separate components to be
25 located throughout the home without restriction. The data communicated between the units
26 may be secure data. In addition, the library 262 may provide power to the viewer 266 through
27 the hard wire communication link 615.

1 To receive and strip data from a video signal at the consumer's home, a device such
2 as a cable interface device or cable connector 212 is used. The cable connector device
3 includes a tuner 613, while the cable interface device makes use of existing tuning equipment
4 in the home. In either configuration, data is stripped from the video signal and stored at the
5 subscribers location in the library 262. The phone connector 270, optional connector 611,
6 and modular connector 701 initiate communications and transmit ordering and billing
7 information to the operations center 250 or billing and collection system 278. A digital
8 connector 619 is provided to communicate digital information with the set top 601. The library
9 262 is the intelligent component of the home subsystem, incorporating the hardware and
10 software necessary to store the text data, generate menus and effect the purchase transactions.
11 In addition to an RF transceiver 604, the home library 262 also includes the necessary jacks
12 and connections to allow the system to be connected to the viewer 266. As shown in Figure
13 6b, the library 262 communicates the text data to the viewer 266 in a secure format, which
14 requires a key 605 for decryption. The text may be decrypted page by page just before
15 viewing.

16 a. The Video Connector

17 Figure 7 shows the flow of the processes performed by the video connector 212. The
18 video connector 212 receives the video signal 608, tunes to the channel containing the text data
19 612, strips the text data from the video signal 616, and communicates the text data stream to
20 logic components in the library 620.

21 The connection to the video distribution system may be a cable connector to a cable
22 television delivery system, as shown in Figure 6b. The cable connector includes a data stripper
23 circuit 617, which accepts video input from either a set top converter, TV or VCR 601, or an
24 optional tuner block 613 that receives the CATV signal through the cable connector 212'. The
25 data stripper circuit 617 strips data out of the video, and outputs a digital bit stream to the
26 digital logic portion 609 of the library unit 262. The data is embedded in the video signal either
27 in the vertical blanking interval or the active video portion in an encrypted and compressed

1 format. The data stripper circuit 617 can be placed inside the set top converter box 601, TV,
2 or in the library unit. The data stripper circuit 617 outputs the digital bit stream to be used by
3 the library digital logic 609.

4 The video connector 212 may also contain a channel tuner module 613 that can tune
5 to the video channel and provide access to the video that contains the data to be stripped.
6 Using the optional tuner module 613, a set top converter, VCR, or TV tuner is not needed in
7 the home subsystem. The optional tuner module 613 would instead receive the CATV signal
8 directly through the cable connector 212. Additional connector options, which allow for the
9 receipt of text files using alternative delivery methods, are presented in Section VII. This
10 ubiquitous access is provided using the modular connector 700 as depicted in Figure 6b.

11 b. Library

12 An embodiment of the library 262 for a two unit home subsystem is shown in both
13 Figure 6b and Figure 8. The embodiment shown includes the following optional parts: the
14 video connector 212, phone connector 270, RF transceiver 604, and battery pack 624 in
15 addition to a removal portable memory 600', microprocessor 628, instruction memory unit
16 632, digital logic 636, and power unit 640.

17 The library 262 contains a digital logic section 609 (not shown in Figure 8) which
18 includes the microprocessor 628, the digital logic 636 and the instruction memory unit 632.
19 The microprocessor 628 may be a secure microprocessor such as the Mot SC21 device sold
20 by Motorola. The digital logic section 609 will receive the serial digital bit stream from the data
21 stripper circuit 617 and process the data. Error correction will also be performed by the digital
22 logic section 609 and the data will be checked for proper address. If the address of the data
23 is correct and the library 262 is authorized to receive the data, the data will be transferred to
24 the memory storage unit 600, 600'. Authorization to receive the data is provided by the cable
25 headend or another distribution point. An authorization code may be sent in the serial digital
26 bit stream. The digital logic section 609 will send appropriate text and graphical data to the

1 memory storage unit 600, 600'. It transfers this data in a compressed and encrypted format
2 and the data remains stored in a compressed and encrypted format.

3 i. Memory Storage Unit

4 The memory storage unit of the library may be a removable portable memory unit 600'
5 (as shown in Figures 6a, 6b and 8). A variety of options are available for memory storage: a
6 hard disk drive, such as an 80 megabyte, a 200 megabyte, a hard disk with removable platters,
7 and CD ROM. Referring to Figure 6b, a hard disk drive unit 600', which contains removable
8 platters, may also be used. This would provide virtually unlimited library storage capacity.
9 Data will be stored in the memory storage unit in a compressed and encrypted format. As is
10 also shown in Figure 6b, the data may also contain a key or unique ID number that matches
11 the ID or key of the viewer 266. This matching of a unique key or ID number prevents
12 unauthorized transfer of text data from the memory storage unit to an unauthorized viewer.
13 Small memory devices such as smart cards, electronic memory cards or PCM CIA cards
14 (personal computer memory card industry association) may also be used to store the data.

15 ii. Power Circuitry

16 As shown in figures 6b and 8, the library 262 will accept power from AC wall power
17 610, DC power 640, or optional battery power 624. The power circuitry 610, 640 may
18 provide all the voltage necessary from either the battery 624 or AC unit for the various circuitry
19 in the library. The power circuitry 610, 640 may also provide power to the viewer through a
20 single data cable when connected to the viewer. The power circuitry 610, 640 will recharge
21 the battery using AC power when in operation. With the optional battery unit 624 installed, the
22 library 262 becomes a portable unit and can still provide power to the viewer 266. In order
23 to extend battery life, power conservation measures may be utilized, such as shutting down the
24 memory system when not in use. When the viewer unit 266 is being utilized and the library
25 circuitry is not being utilized, virtually all power may be shut down to the library 262.

iii. Connection to the Public Telephone System

In an embodiment, the connection to the telephone system may be provided by a connector device 611, which consists of a modem. Various available modems may be used to perform this function. As shown in Figure 6b, cellular phone or PCN phone connections 611' may also be provided. When the home system 258 is first initialized, the modem may be used to transfer the name and credit card information of the consumer to the billing and collection system 278. The telephone connection 270 may be utilized each time an electronic book is purchased by a consumer to complete and record the transaction. The telephone connection 270 may also be used to receive the text data from the operations center 250, bypassing the video distribution system 208. The phone connection 270 may be a separate unit as shown in Figure 6b. However, alternate means exist to connect the home system 258 to the billing and collection system 278 or the operation center 250. The modular connector 701 (shown in Figures 6b and 8) provides access to each communication network to provide a path from the home system 258 to the billing and collection system 278 or the operations center 250. These alternatives are presented in detail in Section VII.

iv. Library Processing

Figure 9 shows for one embodiment, an example of processing performed by the digital logic section 609 of the library 262 on the data stream 651 received from the video connector 212 or stripper circuit 617. In step S650, digital logic section 609 checks the data stream 651 for error correction. If an error is detected, in step S654 digital logic section 609 de-interleaves the data and in step S658 runs a FEC (Forward Error Correcting) algorithm. In steps S650, S654 and S658, the digital logic section 609 performs the error correction needed on the data stream. If no error correction is necessary the digital logic section 609 proceeds to step S662 and checks data packets individually for packet address.

If the address is a unique address, the process moves to step S666 and the digital logic section 609 checks whether the address of the packet matches the library box ID number. The library box ID number is a unique number associated with the library 262. The library box ID

1 is used to ensure security of the data. The process then moves to step S670 and the digital
2 logic section 609 determines whether an electronic file has already been opened into which the
3 data packet can be saved. If no data file has been opened, the digital logic section 609 opens
4 a new data file for that packet. If an electronic file has been opened, the process moves to step
5 S678 and the digital logic section 609 saves the packet in the electronic file on disk. The
6 process moves to step 682 and the digital logic section 609 checks to see if this is the last
7 packet for a particular book for a particular textual data block being received. If it is the last
8 packet of information, the process moves to step 686 and the digital logic section 609 closes
9 the electronic file and updates the directory of available electronic files. Following either step
10 S682 or S686, the process returns to receive another data packet from the data stream
11 received from the data stripper block.

12 If the packet address is checked and the address is determined to be a broadcast
13 address, the process moves to step S690 and the digital logic section 609 determines the type
14 of message that is being sent. The message may be an index of book titles, menu (and menu
15 graphics) information, announcements, special offerings, discounts, promotions, and previews,
16 for example. The process then moves to step S694 and the digital logic section 609 stores the
17 message in an appropriate electronic message file. The process then returns to step S650 to
18 receive another data packet and perform another error check.

19 Using the process of Figure 9, the library 262 is able to receive, store and update
20 directories related to the textual data and graphical data (that can be used to depict pictures
21 in a given book or to generate menus). Variations of the processes are possible depending on
22 the format of the data and operating system of the library 262.

23 Figure 10 shows an example of the processing of information requests from the viewer
24 266 at the library 262. Information requests from the viewer 266 are received either through
25 the cable connecting the viewer 266 to the library 262 or through wireless transmissions such
26 as RF. It is possible in some embodiments for subscribers' requests to come from a set top
27 converter box 602 (see Section V).

1 Information requests received from the viewer 266 generally fall into three categories:
2 (1) directory data of books stored in the library 262, (2) index of all available books on the
3 system, and (3) requests for a specific book (step S700). In step S704, the digital logic section
4 609 answers a request from the viewer 266 for a directory of data showing the books stored
5 at the viewer 266. The directory of data is sent to the viewer 266 so that it may be displayed
6 to the subscriber. In step S708, the digital logic section 609 handles requests from the viewer
7 266 for an index of all available books on the system. The library 262 will obtain an index of
8 all the available books on the system and transmit that index, in step S712, with menu
9 information to the viewer 266. In step S716, the digital logic section 609 replies to a request
10 from the viewer 266 for a specific book. In step S720, the digital logic section 609 opens an
11 electronic file for the specific book requested by the viewer 266 and transmits the record or
12 transmits the information on a packet-by-packet basis to the viewer 266. This process of
13 transmitting the specific book, record, or packets to the viewer 266 continues until the last
14 record or packet has been sent in step S724.

15 In addition to the processes shown on Figure 10 in handling a request for a specific
16 book, the library 262 also orders and receives specific books from the operations center 250
17 using the process as described in step S716. Following a request for a specific book which
18 is not stored at the library 262, the library 262 will proceed to determine the next available time
19 the book will be on the video distribution system 208 or an alternative delivery system and
20 ensure reception and storage of that book (process not shown). In performing this process the
21 library 262 will transmit to the viewer information on when it will obtain the text data for the
22 book so that the subscriber may view the book. In addition to timing information, price and
23 other ordering information may also be passed by the library 262 to the subscriber.

24 c. The Viewer

25 Figure 11 is a block diagram of a viewer 266 showing its internal components. The
26 viewer 266 of Figure 11 is similar to the viewer 266 depicted in Figure 6b. The viewer 266
27 is designed to physically resemble a bound book. The viewer 266 is made up of five primary

1 components and seven optional components: (1) LCD display 602, (2) digital circuitry (not
2 shown), (3) video graphics controller 607', (4) controls 740, (5) book memory 728, (6)
3 optional power supply circuitry 736, (7) optional battery 603', (8) optional RF transceiver 604,
4 and (9) optional cellular or mobile connector (such as 611') (10) optional keyboards 267 and
5 268, and (11) an optional speaker/microphone 608', (12) optional alternative communication
6 interface devices.

7 (1) A high resolution LCD screen 602, of VGA quality, may be used by the viewer
8 266 to display text and graphic images. The screen may be the size of one page of an
9 electronic book. A two page screen or two screens may also be used with the viewer 266.

10 (2) Digital circuitry that includes a secure microprocessor 621, instruction memory
11 732, and digital logic. Data is transferred to the viewer 266 in compressed and encrypted
12 format. The secure microprocessor 621 compares the ID number of the viewer 266 with the
13 incoming data stream and only stores the text data if the ID number of the viewer 266 matches
14 that within the incoming data stream. The viewer 266 may be configured to not output text data
15 or other data and that the data is decompressed and decrypted only at the moment of viewing
16 and only for the current page being viewed. These measures provide additional security against
17 unauthorized access to data.

18 (3) A video graphics controller 607' that is capable of assisting and displaying
19 VGA quality text and graphic images is included in the viewer 266. The graphics controller
20 607' is controlled by the digital circuitry described above. Text may be displayed in multiple
21 font sizes.

22 (4) The viewer 266 of Figure 11 has touch panel controls 740. These unique and
23 novel controls 740 allow the consumer to select stored electronic books and electronic books
24 from catalogues, move a cursor, and turn pages in an electronic book. Typically, the controls
25 740 include forward and reverse page buttons 742, 741, a ball 743 for cursor movement, one
26 or more selection buttons 745, a current book button 747 and a bookmark button 749 (see
27 Figure 14a).

1 The controls 740 should be easy to use and conveniently located. Referring to Figure
2 14a, the controls for the viewer 266 may be located below the screen 602 at the bottom
3 portion of the viewer 266. The next page turn button 742 is the most used button 740 and is
4 located towards the right edge of the page. The subscriber is likely to use right hand thumb
5 movements to work the controls particularly the page turn buttons 741, 742. Therefore, the
6 buttons may be arranged in such a manner that the buttons are easily controlled by a
7 subscriber's right thumb. Generally, this can be accommodated either on the lower portion of
8 the viewer 266 (as shown) or along the right hand margin of the viewer 266 (not shown). The
9 current book button 747 and bookmark button 749 are usually the least used of the controls
10 740. Therefore, in the example shown, those buttons 747, 749 are located on the inside
11 portion towards the binder of the viewer 266. Locating the ball 743 or other cursor
12 movement device (such as four pointer arrows not shown) in the bottom center of the viewer
13 266 is both easier for the subscriber to use and easier in manufacturing the viewer 266. The
14 selection buttons for the cursor 745 may be located below the middle diameter of the cursor
15 ball 743 on the right and left sides of the ball as shown. If pointer arrows are used for cursor
16 movement, a selection button 745 may be located in the center of the four arrow buttons (not
17 shown). Again, the most used controls 740 should be located where a subscriber's right hand
18 thumb would normally rest.

19 (5) Book memory 728 for at least one electronic book or more of text is included
20 in the viewer 266. The memory 728 stores text and any graphics, which represent pictures in
21 a book. The memory 728 can also store menu graphics data. Two different memory 728
22 devices may be used in the viewer 266, one for the instructions for the microprocessor 621 in
23 the digital circuitry and a second type of memory may be used for the book memory 728 (and
24 graphics). Various memory devices available on the market may be used such as, ROM,
25 RAM or a small hard disk. Since an electronic book requires approximately 0.6 megabytes
26 of storage, a small hard disk providing approximately 60 MBytes of storage provides memory
27 to store approximately 100 electronic books.

1 Text for electronic books may be displayed in various font sizes. To accommodate
2 various fonts for display, a variety of fonts are stored in instruction 732 or book memory 728.
3 Thus larger or smaller fonts may be recalled from memory 621, 728 to create displays desired
4 by the subscriber.

5 (6) Power supply circuitry 736 in the viewer 266 will accept power from either an
6 AC power source or from an optional battery 603', or the library 262. The power supply
7 circuitry 736 provides the necessary voltages to accommodate the various systems within the
8 viewer 266.

9 (7) An optional battery 603' is provided in one embodiment. The battery 603' is
10 automatically recharged when AC power is available.

11 (8) An optional RF transceiver 604 which provided two-way data link between
12 the viewer 266 and other components of the home subsystem can also be included in the
13 viewer 266.

14 (9) Also, the viewer 266 may include a cellular transceiver (not shown) for mobile
15 communications.

16 (10) The optional wired (attached) keyboard 267 and wireless (e.g., RF) keyboard
17 268 (see Figure 6a) may be used with the viewer 266 to provide communications between the
18 subscriber and the viewer 266.

19 (11) The optional speaker and microphone 608' allow the viewer 266 to provide
20 audio signals to the subscriber, and allow the subscriber to provide an audio input. The
21 speaker and microphone 608' may be used in conjunction with the cellular transceiver 608 or
22 other telecommunications equipment to provide for reception and transmission of telephony and
23 data.

24 (12) The optional alternative communication interface devices allow the viewer 266
25 to make use of a variety of communication paths.

26 The viewer 266 of Figure 11 has parts available for providing connections to: a library
27 744, electronic card memory 748, CD ROM units 752, and a portable memory unit 756 (such

1 as that shown in Figure 6b as 600'). Various electronic memory cards such as PCMCIA can
2 be used with the viewer 266 to supply and store electronic books.

3 Security, low power consumption and excellent display technology are desired features
4 of the viewer 266 design. The viewer 266 should be lightweight and portable. The viewer 266
5 contains a software operating system that allows electronic books to be stored, read and
6 erased and includes the capability to order electronic books and retain them in memory 728
7 for a predefined period of time determined by the system operator. The software can be
8 configured to allow the electronic book to be read during a period of time (i.e., two weeks) and
9 then automatically erased, read once and erased, or held in memory permanently. Each viewer
10 266 may have a unique key 605. All of the data storage may be encrypted with the key 605
11 for an individual viewer 266 to prevent more than one viewer 266 accessing the text file or
12 electronic book file.

13 Figure 12 is a flow diagram of some of the processes executed by the microprocessor
14 621 in the viewer 266. The viewer 266 may receive inputs from the subscriber through touch
15 panel controls 740. In step S800, the subscriber's information requests are then processed by
16 the microprocessor 621.

17 In step S804, if the subscriber requests a menu of available electronic books, the
18 microprocessor 621 will select an electronic book menu. In step S808, the microprocessor
19 621 will open the electronic files that list the electronic books which are available (related to
20 the category of topic of the menu) and display the menu with the names of the available
21 electronic books.

22 If the subscriber selects a particular book to read, then in step S812, the
23 microprocessor 621 will process the selection and determine the electronic file that contains
24 the specific electronic book. In step S816, the microprocessor 621 will open the file for that
25 specific electronic book and normally access the first page. (If a pointer has already been set
26 in that books electronic file, the process may default to that page.) In step S820, the
27 microprocessor 621 will then determine which page needs to be displayed. That is, the

1 microprocessor 621 will determine whether a next page, previous page or a bookmarked page
2 needs to be displayed. If the pointer for the electronic file is not in the correct location then in
3 step S828, the microprocessor 621 will move the pointer and obtain the previous page of data
4 from the stored file. Otherwise, in step S824, the microprocessor 621 will normally obtain the
5 next page of text from the stored electronic file. In step S832, the microprocessor 621 will
6 decrypt and decompress the text data and send the data to the video display. The video
7 display will generally have a video display memory associated with it. In step S832, the
8 microprocessor 621 will send the data directly to that video display memory. The circuitry for
9 the display then completes the process of displaying the page of text.

10 If the subscriber, through the controls 740, requests (from step S800) that the power
11 be turned off, then in step S836, the microprocessor 621 initiates power off. In step S840, the
12 microprocessor 621 saves the pointer in memory to the page number in the book that the
13 viewer 266 is currently reading. In step S844, the microprocessor 621 closes all the electronic
14 files and signals the power circuitry to shut down the power to the various circuits in the viewer
15 266. With these examples of basic processes the viewer 266 is able to display book selections
16 and display text from those electronic books.

17 d. Menu System

18 Referring generally to Figure 13, the electronic book system 200 may have a menu
19 system 851 for selecting features and books from the electronic book system 200. The
20 operating software and memory required for the menu system 851 may be located at the
21 viewer 266 (e.g., the instruction memory 732 and/or book memory 728). However, it can also
22 be located at the library 262 (e.g., the instruction memory 632) or the library 262 and the
23 viewer 266 can share the software and memory needed to operate the menu system 851.
24 Since the menus are usually displayed on the viewer, and since the viewer 266 may be capable
25 of operating in the absence of the library 262, the basic software and memory to create the
26 menus is more conveniently located at the viewer 266.

1 The menu system 851 allows sequencing between menus and provides menu graphics
2 for graphical displays such as on the LCD display 602 of the viewer 266. In an electronic
3 book system that uses a set top converter these menus may also be displayed on a television
4 screen. In an electronic book system that uses a computer, these menus may also be displayed
5 on the computer monitor. In an embodiment, the menus provide just basic text information
6 from which the subscriber makes choices. In other embodiments, the menus provide visual
7 displays with graphics and icons to assist the subscriber and allow for subscriber interaction and
8 real-time ordering of electronic books or other content available to the subscriber.

9 Figure 13 depicts the menu system 851 with sequencing. The primary menus in the
10 menu system 851 are an introductory menu 850, a main menu 854 and various submenus 858.
11 In the embodiment shown, there are three levels of submenus 858. In certain instances one or
12 two submenus 858 is sufficient to easily direct the subscriber to the selection or information
13 requested. However, there are features in which three or more submenus 858 make the user
14 interface more friendly for the subscriber. Each level of submenus 858 may consist of multiple
15 possible menus for display. The particular menu displayed depends on the selection by the
16 subscriber on the previous shown menu. An example of this tree sequence of one to many
17 menus are the help submenus 887, 888. Depending upon the specific help requested, a
18 different level two help menu is displayed to the subscriber.

19 An example of an introductory menu 850 is shown on Figure 14a. Generally the
20 introductory menu 850 introduces the viewer 266 to the system and provides initial guidance,
21 announcements and instruction. The introductory menu 850 is followed by a main menu 854,
22 an example of which is shown in Figure 14b. The main menu provides the viewer 266 with the
23 basic selection or features available in the system. Figure 14b is an example of a main menu
24 854 offering many additional features and submenus 858 to the subscriber. For example,
25 Figure 14b shows that the viewer 266 is able to choose by a point and click method, many
26 options including: (1) free previews, (2) books you can order, (3) books in your library, (4)

1 your current book, (5) help, (6) on-line services and (6) other system features. Following a
2 selection on the main menu 854, a corresponding submenu 858 is shown.

3 Figure 13 shows fourteen available primary or first level submenus. They are (1)
4 account set up 862, (2) free previews 866, (3) book suggestion entries 855, (4) books in your
5 library 872, (5) books you can order 878, (6) your current book 884, (7) help 887, (8)
6 available features 890, (9) messages 893, (10) account information 896, (11) outgoing
7 message submenu 898, (12) show links submenu 970, (13) create links submenu 980, and (14)
8 show interactive files submenu 990. Figure 14c is an example of a first level submenu for
9 books in your library 872. This "Book In Your Library" example submenu 872 shows six
10 available books by title and author and provides the subscriber with the ability to check a
11 different shelf of books 874 or return to the main menu 854. Figures 14d and 14e show
12 example submenus 858 for books that may be ordered using the "Books You Can Order"
13 submenu 878.

14 Figure 14f is an example of a confirmation menu which confirms a subscribers order.
15 In this particular example, the subscriber is required to enter a PIN number to complete the
16 subscriber's order. Any alpha-numeric or similar password may be used to ensure the
17 subscriber is an authorized subscriber. In one embodiment, the subscriber confirms an order
18 with a PIN or password and then receives a final confirmation screen. The final confirmation
19 screen is primarily text and may state:

20 **Your book order is now being processed using CABLE.**

21 **Your book will be delivered overnight and your VISA account will be charged**
22 **\$2.95.**

23 **Your book will be available for reading at 6:00AM EST tomorrow. Make sure**
24 **that:**

25 **1. your Library Unit and Cable Connection Unit are plugged in with aerials up**
26 **tonight; and**

1 **2. you tune your cable converter to THE BOOK Channel. The TV set does**
2 **not have to remain on.**

3 or similar language.

4 Examples of the "Account Set Up Menu" 862 and further submenus 858 related to
5 account set up (which provide instructions and account input 864) are shown in Figures 14g
6 and Figure 14h. These submenus 858 allow initialization of an account at the operations center
7 250 and orders to be charged to credit cards. The submenus 858 include the ability to enter
8 data related to your desired PIN number or password, credit cards, phone numbers, etc. In
9 one embodiment, the account set up be performed using the telephone system. A confirmation
10 menu verifies that the account has been properly set up with the desired PIN or password and
11 credit card. However, additional set-up methods are presented in Section VII.

12 Free previews for books 866 are also provided by submenus (868, 870). Examples
13 of the free preview menus are shown in Figure 14i and Figure 14j. Figure 14i shows a menu
14 depicting various books for which previews are available for viewing. Following a book
15 selection, a screen submenu showing an excerpt of the selected book cover's description is
16 provided along with an excerpt from a critic's review of the selected book. In one
17 embodiment, this preview screen for a particular book also allows the subscriber to select a
18 submenu which provides information about the author. The book preview submenu may also
19 include a still video picture or graphics portraying a book cover or a scene from the book. An
20 example of such a still video picture or graphics is shown in figure 14j which depicts a preview
21 screen 870 about the author. The author's preview screen 870 shows a picture of the author,
22 provides a short biography, and may allow the subscriber to order the author's books. The
23 price for ordering the authors various books may also be shown on the menu.

24 In addition to free previews, in other embodiments, the electronic book system 200
25 provides the subscriber with a book suggestion feature (see 855). This is accomplished using
26 the menu system 851 and the processor with associated memory located at the viewer 266,
27 library 262 or at the distribution point (1020 or 250). When necessary, information for the

1 book suggestion feature is sent in the text data of the signal to the home system 258. With this
2 feature, books or authors are suggested to a subscriber based upon historical data of the
3 subscriber's previous orders, demographics or mood of the subscriber, other indicators, and/or
4 by text word searches.

5 In one book suggestion embodiment, text word searches of preview information (such
6 as book cover descriptions, critics reviews and biographies about the author) and/or text of
7 books or other titles are performed by the library 262 using databases stored in the library
8 memory 600. Personalized book or author suggestions are made to the subscriber by obtaining
9 information from the subscriber indicative of general subscriber interests. Subscriber entries
10 may be solicited from the subscriber using the book suggestion entry submenu 855. The
11 system uses these subscriber entries either directly or indirectly to search for books or authors
12 to suggest to the subscriber.

13 Generally, the electronic book suggestion methods may be categorized into two
14 categories, either responsive methods (which respond to a series of subscriber menu entries),
15 or intelligent methods (which analyze data to suggest a book). Using a responsive or intelligent
16 method, the system 200 determines a list of suggested titles or authors and creates a second
17 or third level submenu 856, 857 to suggest the titles for subscriber selection.

18 Responsive methods of suggesting titles include, for example, the use of mood
19 questions, searching for authors, and keyword searching. Using the instruction memory 732
20 and menu generation hardware (e.g., 607) of the viewer 266, a series of mood questions can
21 be presented on menus to determine a subscribers interest at a particular time. For this
22 methodology, the operations center's 250 processor 404 and instruction memory 416 assign
23 each title mood indicators (and sub-indicators) from a group such as light, serious, violent,
24 short, long, dull, exciting, complex, easy-read, young theme, old theme, adventure, romance,
25 drama, fiction, science-fiction, etc. These indicators are sent to the home system 258 with the
26 text data and are stored in library memory 600. Based upon the subscriber entries, the

1 processor associates a set of indicators with the subscriber's request and a set of books with
2 matching indicators are located for suggesting to the subscriber.

3 Responsive searches for authors or keywords (a search word provided by the
4 subscriber) are generally performed by the library processor 628 and instruction memory 632
5 on data stored in the library memory 600. For example, a keyword given by the subscriber
6 may be searched for a match in library memory 600 storing the book reviews, critics and
7 previews databases. Thus, if a subscriber provided an entry of the word "submarine" on an
8 appropriate submenu, the title "Hunt For Red October" may be located by the microprocessor
9 628 using instruction from a routine in instruction memory 632.

10 Intelligent methods of suggesting programs include analyzing personal profile data on
11 the subscriber and/or historical data about the subscriber such as past books ordered by the
12 subscriber (or buy data). This method may be performed at the distribution point or operations
13 center 250 by the on-site processor 404 using subscriber databases stored in memory 428.
14 The home system 258 receives the text data including program suggestion information from the
15 distribution point or operations center 250 and generates the program suggestion submenus
16 855, 856, 857 using the same text data receiving 212 and viewer menu generation hardware
17 (e.g., 607, 621) described above. Software routines and algorithms stored in instruction
18 memories (e.g. 632, 732) are used to analyze historical data and book ordered data to
19 determine a line of books to suggest to the subscriber.

20 The algorithms for this powerful feature of suggesting books or authors to subscribers
21 is disclosed in great detail in U.S. Patent Number 5,798,785, entitled TERMINAL FOR
22 SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY SYSTEM, filed
23 December 2, 1993, which is incorporated herein by reference.

24 Referring to Figure 13, submenus 858 are shown on the "Books In Your Library"
25 submenu 872 and may be broken into shelf numbers with submenus for each shelf 874, 876.
26 The submenus 858 for the "Books You Can Order" submenu 878 is similarly broken out into
27 submenus by shelves 880, 882. These shelves may each be a category or genre of books.

1 Books may be grouped into categories such as best sellers, novels, fiction, romance, etc. See
2 Figure 14d.

3 Referring to Figure 13, the submenu 858 for "Your Current Book" 884 allows a
4 subscriber to select a current book 884 and then determine what page to view. This selection
5 is confirmed with a level two submenu 885. The help submenu 887 provides the subscriber
6 with additional help screens 888. The submenus 858 for available features 890 may be broken
7 out into a sequence of separate submenus for each feature 891, 892.

8 Referring to Figure 13, messages can also be sent with the electronic book selection
9 and delivery system 200. A level one message screen provides the subscriber with the ability
10 to select from various messages the subscriber has pending 893. Each message is then shown
11 on a separate submenu screen 894, 895. The message may contain text and graphics.

12 Referring to Figure 13, account information is shown on a level one submenu 896 and
13 then follow-on submenus 858 show the recent orders and your account balance 897. There
14 is also a level one submenu for outgoing messages 898 which has a follow-on submenu used
15 as an input screen 899.

16 In addition to the specific features and submenus described in Figure 13 and Figure 14a
17 through Figure 14j, many other variations and features are possible. When a book is finally
18 selected for viewing the title page 886 will appear on the screen followed by a page of text.

19 III. Billing And Collection System

20 In one embodiment, the billing and collection system 278 (shown in Figures 2 and 3)
21 utilizes the latest technology in electronic transaction and telephone switching to track orders,
22 authorize deliveries, bill consumers, and credit publishers automatically. The telephone calls
23 initiated by the phone connector 270 are received by the billing and collection system 278
24 which responds immediately without human intervention by placing the order and charging the
25 consumers credit card account. Data is compiled periodically and publishers 282 are credited
26 for sales of their books or other text. The billing and collection system 278 may also connect

1 with subscribers through two-way cable connections, cellular, or other communication means.
2 These additional methods are detailed in Section VII.

3 The billing and collection system 278 communicates with the operations center to track
4 changes in available books and to provide statistical data to the operations center 250.

5 IV. Public Library, School, and Bookstore System

6 The electronic book system can be modified to be used at public libraries, schools,
7 bookstores, newsstands, or stand-alone kiosks. Figure 15 shows one possible arrangement
8 of components for the distribution location. The main unit is the file server 900. The file server
9 900 is a large electronic memory unit that can store thousands of books, newspapers, or
10 periodicals. Various electronic storage means may be used in the file servers, such as hard
11 disks, read-write CD ROMs and read-only CD ROMs.

12 The system comprises five components; the file server 900, a converter or video
13 connector 904 or connector capable of interfacing to one of the alternative delivery systems
14 presented in Section VII, a controller 908, a viewer 912, and a catalog printer 916. The
15 software for controlling the system is primarily located in the controller 908. The converter or
16 video connector 904 is similar to those described above. In this configuration the controller unit
17 908 monitors the data being transferred to the file server 900 by the converter 904. The
18 controller 908 may be provided with a viewing screen and several control buttons. When it
19 is necessary to have a larger screen to perform more sophisticated controlling of the system a
20 viewer 266 may be connected to the controller 908 and the viewer screen and controls 740
21 may be used.

22 For security reasons, the controller 908 is only able to download books to public
23 viewers 912 which are authorized to receive books from the particular file server 900. Also
24 for security reasons it is not desirable that the public viewer 912 have access to more than one
25 file server 900. In this way, security can be maintained over the text data for books. The
26 public viewer 912 may be limited to receiving one or two books at a time from the controller
27 908. When the user of the public viewer 912 needs a new or additional book, the user returns

1 the viewer 912 to the school or public library where the user receives a new book from the
2 controller 908.

3 In order to track the books that are available on the file server 900, the titles of the
4 available books may be printed on a catalog printer 916. The catalog printer 916 is connected
5 to the library controller 908 and the titles of the books are downloaded to the catalog printer
6 916. For security reasons, the coded text for any of the electronic books may not be
7 authorized for printing using the controller 908 and catalog printer 916. In order to maintain
8 security over the data, none of the electronic book data may be allowed to be downloaded to
9 the printer 916. Once a complete printout of available book titles, magazines, or other textual
10 material is complete, a hard copy of the catalog 920 can be maintained at the file server 900.

11 The system shown may also be used at bookstores. The bookstores can rent the
12 public viewer 912 to customers with the text for one or two books loaded onto the public
13 viewer 912. The public viewer 912 may be provided with an automatic timeout sequence. The
14 timeout sequence would erase the textual data for the books after a certain period of time, for
15 example, two weeks. It is expected that after a period of time (perhaps within two weeks) the
16 renter would return the public viewer 912 to the bookstore and receive additional books for
17 viewing. Using this arrangement, it is also possible for the bookstore to (permanently) sell a
18 viewer 912 to a regular customer. The customer then returns to the bookstore from time to
19 time to receive textual data for a book which the customer can then store permanently on the
20 customer's own viewer 912. Various other configurations are possible for bookstores, schools
21 and public libraries using the file server 900 and public viewer 912 described.

22 V. Use Of A Set Top Converter

23 Existing set top converter boxes such as those made by Scientific Atlanta or General
24 Instruments are presently unequipped to handle the book selection system of the present
25 invention. Although set top converters may be built which include the library functions,
26 hardware modifications are necessary in order to use the book selection system with existing
27 set top converter technology.

1 Figures 16a and 16b are examples of hardware modifications or upgrades. A port is
2 used to attach hardware upgrades described below to a set top terminal. Two upgrades are
3 possible to set top converters 601 to assist in receiving and selecting electronic books, a menu
4 generation card upgrade (Figure 16a) and an information download unit (Figure 16b). Each
5 of these upgrades may be connected to the set top terminal unit through an upgrade port. A
6 four wire cable, ribbon cable, FireWire (IEEE 1394B) interface connector, USB connector,
7 or the like may be used to connect the upgrade to the set top converter 601.

8 A card addition 950 to a set top converter 601 is depicted in Figure 16a. The card
9 950 shown provides the additional functionality needed to utilize the book selection system with
10 existing set top converter 601 technology. The card 950 may be configured to slip inside the
11 frame of a set top terminal and become part of the set top terminal, an advanced set top
12 terminal. The primary functions the card 950 adds to the set top converter 601 are the
13 interpreting of data signals, generating of menus, sequencing of menus, and, ultimately, the
14 ability of the subscriber to select a book using either the television or a viewer 266. The card
15 950 also provides a method for a remote location, such as the cable headend, to receive
16 information on books ordered. The books ordered information and control commands may
17 be passed from the cable headend to the card 950 using telephone lines or alternative ordering
18 methods as presented in Section VII.

19 The primary components of the card 950 are a PC chip CPU 952, a VGA graphic
20 controller 954, a video combiner 956, logic circuitry 958, NTSC encoder 960, a receiver 962,
21 demodulator (not shown), and a connector 611', which consists of a dialer. The card 950
22 operates by receiving the data text signal from the cable headend through the coaxial cable.
23 The logic circuitry 958 of the card 950 receives data 964, infrared commands 966, and
24 synchronization signals (not shown) from the set top converter 601. Menu selections made by
25 the viewer 266 on the remote control are received by the set top converter's 601 IR equipment
26 and passed through to the card 950. The card 950 interprets the IR signal and determines the
27 book (or menu) the subscriber has selected. The card 950 modifies the IR command to send

1 the information to the set top converter 601. The modified IR command contains the channel
2 information needed by the set top converter 601. Using the phone line 968 and dialer 611',
3 the card 950 is able to transmit electronic books ordered information to the cable headend.
4 It is also possible to receive the electronic books over the telephone lines and other
5 telecommunications networks, including wireless networks, and by-pass the video distribution
6 system.

7 These commands are passed through the interface linking the set top terminal's
8 microprocessor with the microprocessor of the hardware upgrades. In this way, subscriber
9 inputs, entered through the set top terminal keypad or remote control, can be transferred to any
10 of the hardware upgrades for processing and responses generated therein can then be sent
11 back to the set top terminal for display. In one embodiment the IR commands 966 are
12 transferred from set top terminal 601 to hardware upgrade.

13 Hardware upgrades may include a microprocessor, interactive software, processing
14 circuitry, bubble memory, and a long-term memory device. In addition to these basic
15 components, the hardware upgrade may make use of an additional telephone modem or CD-
16 ROM device.

17 An information download hardware upgrade 1001 shown in Figure 16b allows the
18 subscriber to download large volumes of information from the operations center 250 or cable
19 headend using a set top terminal 610. The hardware upgrade 1001 will enable subscribers to
20 download data, such as electronic books and electronic magazines, to local storage. Primarily,
21 the hardware upgrade 1001 is an additional local storage unit 1003 (e.g., hard disk, floppy,
22 optical disk or magnetic cartridge and may include a microprocessor 1005, instruction memory
23 1007, and a random access memory 1009, as shown in Figure 16b). A small portable viewer
24 may also provided with the upgrade 1001 to enable downloaded text to be read without the
25 use of a television.

26 The downloadable information may be text or graphics supplied by the operations
27 center 250 or cable headend. With the upgrade 1001, electronic books may be downloaded

1 and read anywhere with the viewer 266. Using the upgrade 1001, electronic books may be
2 downloaded and stored in compressed form for later decompression. The electronic books
3 may be decompressed only at the time of viewing. Important text that the public desires
4 immediate access may made available through this system. Text such as the President's
5 speech, a new law, or a recent abortion decision rendered by the Supreme Court may be made
6 immediately available.

7 In one embodiment, electronic book ordering information is stored at each set top
8 terminal 610 until it is polled by the cable headend using a polling request message format. An
9 example of a polling request message format consists of six fields, namely: (1) a leading flag
10 at the beginning of the message, (2) an address field, (3) a subscriber region designation, (4)
11 a set top terminal identifier that includes a polling command/response (or P/F) bit, (5) an
12 information field, and (6) a trailing flag at the end of the message. A similar response frame
13 format for information communicated by the set top terminal to the cable headend in response
14 to the polling request may be used.

15 Figure 17 shows components of a set top terminal 610'. The components include a
16 data receiver 617' and a data transmitter 1011. The data transmitter provides upstream data
17 communications capability between the set top terminal 610' and the cable headend. Upstream
18 data transmissions are accomplished using the polling system described and, using a data
19 transmitter 1011. Both receiver 617' and transmitter 1011 may be built into the set top
20 terminal 610' itself or added through an upgrade module. Regardless of the specific hardware
21 configuration, the set top terminal's data transmission capabilities may be accomplished using
22 the hardware shown in Figure 17.

23 Figure 17 shows RF signals, depicted as being received by a data receiver 617' and
24 tuner 613 working in unison. Both of these devices are interfaced with the microprocessor
25 1013, which receives inputs 1015, from the subscriber, either through a set top terminal's
26 keypad, a remote control unit or viewer 266. Generally, all cable signals intended for reception
27 on the subscriber's TV are accessed by the tuner 613 and subsequently processed by the

1 processing circuitry 1017. This processing circuitry 1017 typically includes additional
2 components (not shown) for descrambling, demodulation, volume control and remodulation on
3 a Channel 3 or 4 TV carrier.

4 Data targeted to individual set top terminals is received by the data receiver 617'
5 according to each set top terminal's specific address or ID. In this way, each addressable set
6 top terminal 610' only receives its own data. The data receiver 617' may receive set top
7 terminal 610' specific data in the information field of the signal frame described or on a separate
8 data carrier located at a convenient frequency in the incoming spectrum.

9 The received data includes information regarding electronic books and menus available
10 for selection. The subscriber may enter a series of commands 1015 using a keypad or remote
11 control in order to choose an electronic book or menu. Upon receipt of such commands, the
12 set top terminal's microprocessor 1013 instructs the tuner to tune to the proper frequency of
13 the channel carrying data and subsequently instructs the processing circuitry 1017 to begin
14 descrambling of this data.

15 Upon selection of an electronic book, the microprocessor 1013 stores any selection
16 information in local memory (not shown) for later data transmission back to the cable headend.
17 The set top terminal's microprocessor 1013 coordinates all CATV signal reception and also
18 interacts with various upstream data transmission components. Typically, the data transmitter
19 1011 operates in the return frequency band between 5 and 30 MHZ. In an alternative
20 embodiment, the frequency band of 10 to 15 MHZ may be used. Regardless, however, of the
21 frequency band used, the data transmitter 1011 sends information to the cable headend in the
22 information field of the response frame described. Those skilled in the art will recognize that
23 a number of variations and combinations of the above-described set top terminal hardware
24 components may be used to accomplish upstream data transmissions.

VI. Books-On-Demand System

The electronic book system 200 described may also be configured in a book-on-demand style. Figure 18a shows one example of a configuration for a book-on-demand system. A book on demand system requires more powerful two-way communications between the consumer's home, bookstore, school or public library and either the operations center 250 or a distribution site 1020 such as the cable headend. In one embodiment, this type of two-way communication can be provided by the hardware shown in Figure 17 and described above. Additional methods related to alternative communication paths are presented in Section VII.

Referring to Figure 18a, in a book-on-demand system, the subscriber selects the book to be download from an available menu of books (see for example Figures 14d and 14e). The data for menus of available books is usually sent to the subscriber location by the distribution site 1020. After the subscriber's menu selection, information about the subscriber selection (or request) is then communicated to either a distribution point 1020 (such as a cable headend) or the operations center 250. Upon receipt of this request, the needed textual and graphical information for the book is spooled and sent to the subscriber. In this manner, electronic books are only sent when requested by the subscriber and are sent immediately upon demand for the electronic book (or text).

In order to support such a demand system, the text delivery and distribution must be conducted on a strong nodal architecture distribution system, such as, a video-on-demand cable or telephone television system, through use of individual telephone calls on the public telephone system or cellular phone system, through the use of the Internet, or a number of other data network options.

The book-on-demand system allows for a greater selection of electronic books to the subscriber and limits the amount of communicated book data that is unnecessary or unneeded. It also provides the electronic book to the subscriber in a much timelier fashion.

1 In addition to a stronger distribution system, a book-on-demand system requires a
2 distribution point 1020 to have more sophisticated equipment to access and "spool out" the
3 textual information. This can be accomplished using file server technology 1024 for storing the
4 books and distribution technology such as ATM 1028 or telephone-type switching (not shown)
5 to distribute the textual information. The file server 1024 and distribution technology that can
6 be used in configuring such a book-on-demand system is described in U.S. Patent No.
7 5,262,875 and U.S. Patent 5,218,695, cited above.

8 Figure 18a shows an embodiment for a book-on-demand system that utilizes file server
9 technology. In addition to books, the embodiment of Figure 18a will support distribution of
10 nearly any digital data. Books or textual files are received from publishers 282 and other
11 sources through local feeds 1032, ATM 1028, or by satellite dish 1036, for example. The data
12 is then stored in memory 1040 at the file server 1024. In one embodiment, the distribution
13 point 1020 is a cable headend that receives requests from subscribers and delivers text to
14 subscribers over a two-way communication system (such as a video-on-demand system
15 (VOD) 1044).

16 The library 262 can be connected to either a basic premium-type service cable system
17 1048, a near video-on-demand type cable system (or pay-per-view (PPV) 1052) or a video-
18 on-demand cable system 1044. In connecting with either of these three systems the library 262
19 may access the cable directly or may access the system through a set top terminal 601', 601",
20 or 601'''.
21

22 Using the two-way video-on-demand system 1044, a subscriber is able to request a
23 specific book title and receive that text immediately following its request. To accomplish this,
24 the distribution point 1020 transmits a list of available books through the cable delivery system
25 to the library 262. The library 262 displays the list of available books on a menu or similar
26 format. As described earlier, the library 262 may use menus which list categories of available
27 books to form its request from the distribution point 1020. After selecting a book the library
262 then sends a request signal on the two-way communication system 1044 back to the

1 distribution point 1020. This request signal can be handled in two ways. The library 262 either
2 initiates the request or the distribution point 1020 polls the various libraries on to the two-way
3 system 1044. Upon receiving the request for the book title, the text associated with that book
4 title is transmitted to the library 262 using the two-way cable system 1044.

5 Figure 18b is an expanded view of an operations center 250 that supports a regional
6 or national book-on-demand system. In fact, the operations center 250 shown supports
7 distribution of nearly any digital data. The operations center 250 supports multiple feeds to
8 receive digital information by tape 1060, 1060', ATM 1028, or satellite 1036. The information
9 is processed through an input MUX 1064 and a small file server 1068 before reaching the
10 master file server 1072. Digital data such as books received from publishers 282 is then stored
11 on the master file server 1072. The digital data may be stored compressed in a standard
12 format such as MPEG2.

13 A system controller 1076 provides control over the regional or national book-on-
14 demand system. Books may be packaged into groups to provide feeds to various cable
15 headends. In addition, scheduling and marketing research are conducted at the operations
16 center 250. In order to handle the scheduling and market research, book buy data is received
17 at the operations center 250 through a multiplexer 1082. Book buy information can be
18 provided by the operation center 250 to the billing and collection system 278.

19 The operations center 250 is also equipped to insert messages or advertisements into
20 the file server. These messages or advertisements will eventually be received by the
21 subscribers.

22 The master file server 1072 uses an output multiplexer 1080 and ATM 1028 as well
23 as satellite connections to distribute digital data. In one embodiment, cable headends receive
24 text data on books from the master file server 1080 through the output multiplexer 1028 and
25 an ATM system 1028. After receiving the digital book data, the cable headends store the
26 books in a local file server 1024. Figure 18a's distribution point 1020 is an example of a cable

1 headend which may receive data from the operations center 250 of Figure 18b through an
2 ATM hookup 1088 or satellite hookup.

3 VII. Alternative Delivery And Ordering Methods

4 Electronic books and related data, including electronic book menu data, may be
5 provided to subscribers by use of an on-demand delivery system in which electronic books are
6 delivered after an order is received by the delivery system. The delivery system may supply
7 the electronic books in real time or near-real time (i.e., near on-demand), or after a delay
8 period that allows the delivery system to process, package and transmit the electronic book.
9 Alternatively, the delivery system may broadcast one or more electronic books in a continuous
10 fashion. In this alternative, the subscriber indicates a desired electronic book from a list of the
11 broadcast electronic books. The delivery system may include a billing system that debits a
12 subscriber's account, or debits a credit card, for example, upon delivery of the electronic book.
13 The delivery system, or a related authorization system, may provide a local authorization code
14 that allows the subscriber to decrypt, store and view the desired electronic book. Alternative
15 delivery systems and methods are disclosed in pending U.S. Application Serial No.
16 09/289,956 entitled, ELECTRONIC BOOK ALTERNATIVE DELIVERY METHODS, filed
17 April 13, 1999, and U.S. Application Serial No. 09/427,938 entitled, VIRTUAL ON-
18 DEMAND ELECTRONIC BOOK, filed October 27, 1999, the disclosure of which are
19 incorporated by reference.

20 a. Internet Delivery Methods

21 Figure 19 is an alternate delivery plan 301' that provides for electronic book delivery
22 using the Internet. In Figure 26, the publishers 282 provide the electronic books to be posted
23 at the Internet web site 279. The publishers may convert the text and graphical data to digital
24 format, compress the digital data, and upload the compressed digital data to the Internet web
25 site 279. Alternately, the publishers 282 may arrange for an outside conversion activity 283
26 to convert the text and graphical data to digital format. The conversion activity 283 may then
27 provide the digital data to the Internet web site 279. For example, a large on-line bookstore

1 could gather publications in electronic form from a variety of publishers, or could convert hard-
2 copy books to electronic form, and post the electronic books on the Internet such as at the
3 Internet web site 279.

4 The electronic books may then be transferred using a public switched telephone
5 network (PSTN), for example, or other communications systems, direct to a subscriber 285,
6 a library 286 and a bookstore 287. The library 286 and the bookstore 287 may also provide
7 electronic books to the subscriber 285.

8 When electronic books are provided by the Internet web site 279, the billing and
9 collecting functions may be incorporated into the Internet web site 279. For example, a
10 subscriber may pay for an electronic book selection by entering a credit card number into a
11 data field of a page of the Internet web site 279. In this configuration, a separate billing and
12 collection system may not be required. Alternatively, the Internet web site 279 may
13 communicate information with the billing and collection system 278.

14 Electronic book delivery over the Internet may be handled using a number of methods.
15 In a method, the electronic book may be downloaded to the requesting home system 258
16 immediately after the order has been processed. Alternatively, the electronic book may be e-
17 mailed to an e-mail address that is entered as part of the ordering process. In another
18 embodiment, as part of the ordering transaction process, the subscriber is provided with
19 location and authorization information that allows the subscriber to retrieve the ordered
20 electronic book at the subscriber's convenience. For delivery of subscription electronic book
21 products, like newspapers, magazines or other periodicals, the Internet web site 279 can
22 deliver the latest version of the product to the subscriber automatically immediately upon logon
23 by the subscriber to the Internet web site 279. Electronic book data may also be embedded
24 into continuous multicast streaming video, audio, or data feeds.

25 Delivery methods that allow for dedicated, full time delivery can be used to provide
26 continuous distribution of electronic book data including requested electronic books from
27 subscribers, electronic books to be broadcast to all subscribers, updated menu contents, and

1 updated advertising. For delivery methods that allow for non-dedicated or user established
2 connectivity, the operations center 250 may manage the timing and delivery of content by
3 delivering the electronic book only when requested, or periodically, to ensure delivery for those
4 home systems that may not be able to receive the delivery. Finally, delivery methods that are
5 capable of two-way communication may be used to provide a return path to the operations
6 center 250 or billing and collection system 278 for the purpose of ordering or requesting
7 updated electronic book information. Two-way communications paths may be used to allow
8 linking from an electronic book home system 258 or viewer 266 to external nodes that provide
9 world watch live content. These delivery methods are described in detail in co-pending U.S.
10 Patent Application Serial No. 09/289,956 entitled ELECTRONIC BOOK ALTERNATIVE
11 DELIVERY METHODS, filed April 13, 1999, the disclosure of which is hereby incorporated
12 by reference.

13 Additionally, although the home system 258 is presented as an independent device that
14 directly interfaces with the delivery system 200, the home system 258 may connect to the
15 delivery system 200 through a set top terminal, TV, PC, radio, or any other device capable of
16 receiving the signal provided by the delivery system 200. Additionally, the home system 258
17 may not be an independent apparatus, having some or all of its functionality supported within
18 the set top terminal, TV, PC, radio, or any other device capable of receiving the signal
19 provided by the delivery system.

20 b. Alternative Ordering Methods

21 Any of the delivery methods described in the section above are viable embodiments
22 for providing access from the home system 258 to the billing and collection system 278 or
23 operations center 250. In an embodiment, the modular connector 701, as shown in Figures
24 6b and 8, may be used to provide the specific protocol formatting and transmission processing
25 to allow the home system 258 to use the communication path. In the embodiment where the
26 PSTN is used to provide access, the modular connector 701 includes the phone connector 270
27 and the modem 611 as depicted in Figure 6b. In the embodiment where the cellular phone

1 system is used to provide access, the modular connector 701 includes the cellular phone or
2 PCN phone 611' as depicted in Figure 6b.

3 c. Mobile Environments

4 A feature provided by delivery methods using a wireless broadcast system, satellite
5 broadcast system, wireless personal communication system, or terrestrial television broadcast
6 system is mobility of the electronic book home system 258 or viewer 266. This mobility allows
7 for ordering and receiving electronic book data anytime or anywhere, from sitting on a beach
8 in Florida to sitting on a bus in New York City. This mobility allows for the delivery of
9 electronic book data subscription products such as daily newspapers, monthly magazines, or
10 books from book-of-the-month clubs. These subscription products may be delivered
11 automatically to the appropriate home system 258 or electronic book viewer 266. Enhanced
12 end-to-end error correction techniques can be added to the transmission system to ensure
13 higher probability of receipt for these mobile environments. Additionally, transmission methods
14 may be implemented that resend packets of electronic book data, changing their delivered
15 order on each resend, to improve likelihood of receipt. For lower bandwidth mobile
16 environments, an electronic book file may be broken up into packets and the packets sent a
17 limited number of times. If the electronic book file is not received completely, the electronic
18 book viewer 266 may initiate a request to the operations center 250 to resend only that portion
19 of the electronic book file yet to be received.

20 VIII. Electronic Book Link System

21 Electronic book links allow the subscriber to use the electronic book viewer 266 to
22 traverse pre-defined paths between content in their currently viewed electronic book to related
23 information contained either elsewhere in the electronic book, elsewhere on the viewer 266,
24 or external to the viewer 266, including in the library unit 262 or in a connected Internet web
25 site. These links provide an organized and methodical method for the subscriber to quickly
26 access related topic areas or seek clarification of the currently viewed material.

1 An electronic book includes first locations, or components, such as words, phrases,
2 sentences, sections of text, paragraphs, pages, chapters, figures, drawings, maps, video clips,
3 and audio clips. Links to second and subsequent locations, or components, contained in the
4 same electronic document or in another related electronic document, file, or database can be
5 associated with each of these first components. First components with underlying links can be
6 highlighted and displayed on the viewer display 602 or on the connected television 259 or a
7 personal computer 261 (see Figure 2). First components that have underlying links associated
8 with them may be identified by assigning them a unique identifier. The unique identifier can be
9 a word or phrase, an alpha-numeric value, a coordinate point, or other unique identifier. In an
10 embodiment, each such first location may be assigned an identifying index value.

11 The use of the index value allows the first components to maintain links with other
12 components, even if the electronic book is altered. For example, a subscriber may use a cut
13 and paste edit feature to move a block of text containing a first component. Cutting and pasting
14 will not affect the status of the first component and its links to other components. Similarly,
15 changing font style or font size will not affect the status of the links.

16 In the creation of an electronic book, or subsequently, the electronic book may
17 undergo a process that maps identifying index values to each of the first components. These
18 index values can then be accessed by software directives that drive the presentation of
19 alternative or linked material (e.g., material at one of the second locations) once a selection is
20 made. For each electronic book, these index values may be contained in a hidden table that
21 maps the identifying index values of all first components with underlying links to the location of
22 the linked material (the second location). Moreover, each such first component may be linked
23 to one or many linked material locations. That is, the first component may be linked to a
24 second component, a third component and so on. An example of a hidden table is presented
25 below.

Identifying Index Value(s)	Component Identifier	Link Number	Linked Material Identifier	Linked Material Description	Linked Material Location (file location / file name / corresponding index value)
135	"Cezanne"	1	More on Cezanne	Reference material on Cezanne	Art-Encyclopedia.com/FrenchArtists/Index Value = 1
135	"Cezanne"	2	Pronunciation	Pronunciation of the word	Websters.com/ Websters E-Dictionary/Index Value = 56221
135	"Cezanne"	3	Audio Clip	Audio file providing condensed Cezanne's biography	Viewer/ Current file/Index Value = 199384
133-135	"PorchScene by Cezanne"	1	Graphic File	JPEG file presenting Cezanne's PorchScene painting	Viewer/ Current file/Index Value = 9382
5673	"reactivism"	1	Definition	Definition of the word	Websters.com/ Websters E-Dictionary/Index Value = 564
4948-4950	"Order <u>Little Women</u> " menu item	1	Book Order	Order the book <u>Little Women</u>	Discovery.com/ Little Women Order/Index Value = 672
4949-4950	" <u>Little Women</u> "	1	Book review	Review of the book "Little Women"	LiteraryWorks.com/ Little Women/Index Value = 1
90462	"Dental diseases"	1	TOC link to Document Body	Link from Table of Contents to desired chapter	Viewer/ Current file/Index Value = 69980
1342	"Dental diseases"	2	Related discussion group	Access to Web discussion group on gum diseases	NoMoreCavities.com/ Index Value = 1
572	"VegieMaster"	1	Product Order	Order the product "VegieMaster"	HomePurchases.com/ KitchenProducts / Index Value = 1
14	"Chesapeake"	1	Video	Video clip of interview with J. Michener on writing of Chesapeake	Viewer/ Current file/Index Value = 38677
14	"Chesapeake"	2	Narration	Audio file – narration of Chesapeake by J. Michener	Viewer/ Current file/Index Value = 38678

As shown in the table, a first location "Cezanne" has an identifying index value 135. "Cezanne" has three links. A link to a second location is to an art encyclopedia. A link to a third location is to an electronic dictionary that provides a pronunciation guide. A link to a fourth location is to an audio file that plays a short biography of the artist. Each of the second, third and fourth locations have their own index value. Linked material location information

1 (i.e., the location of second and subsequent components) can include source location, book
2 name, chapter, page, line, and word as identified by their index value. The source location will
3 provide the delivery system 200 the necessary information to contact the operations center
4 250, the Internet web site 279 (see Figure 2) or another electronic database and request the
5 appropriate material for retrieval and download if it currently does not reside on the viewer 266
6 or the home system 258. In the case that the linked material resides on the Internet web site
7 279 or on another electronic database, the location information in the hidden table allows the
8 operations center 250 or home system 258 to retrieve the desired material from the Internet
9 web site 279 or from the electronic database.

10 If the second component, or linked material, is located at the viewer 266, the processor
11 in the viewer 266 can cause the linked material to be displayed without any communications
12 with an outside source. For example, if the first component is the name "Cezanne" and the
13 linked material, or second location, is in an electronic dictionary stored in the viewer 266, the
14 viewer 266 can display the electronic dictionary entry for "Cezanne." This linked material may
15 be displayed full screen, in a picture-in-picture window, or as an overlay, for example. The
16 entry can also remain hidden, until a user of the viewer 266 commands the entry to be
17 displayed.

18 Upon selection of a component with underlying links, the software directive determines
19 the identifying index values associated with the selected component, searches the table for the
20 index values of the selection made, looks up the corresponding linked location, accesses the
21 location, and displays the linked material on the viewer 266. The linked material can be
22 displayed on the viewer 266 in place of the original source material, or simultaneously with the
23 original source material by displaying the linked material in a picture-in-picture window, via a
24 split screen, or via a screen overlay.

25 Figure 20 shows a portion of a page of electronic text having one or more electronic
26 links. The display 602 may include a show links button 606 and a help button 612. The show
27 links button 606 may be used to display a link menu 971 (see Figure 13 and Figure 21). That

1 is, the viewer 266 can be commanded, via the show links button 606, to display all components
2 that have underlying links. The components may be displayed in a highlighted mode, in a
3 different color, in a unique font, bold or italic typeface, underlined, outlined, or in reverse
4 background mode, for example. To make a selection of a component to view the underlying
5 linked material, the cursor 745 is used to identify the desired selected item. The ball 743 is
6 used to guide the cursor 745 across the page to the desired selected item, and the selection
7 button is used to make the selection. Alternatively, cursor movement for screen navigation can
8 be provided via devices such as a fingerpad, mouse, or joystick. Selection can also be made
9 by incorporating a touch-sensitive screen into the viewer 266.

10 Figure 20 depicts the display before commanding the viewer 266 to show links. Figure
11 21 shows the display once the request has been made to display all underlying links. Figure
12 21 shows the link menu 971, a help button 612, and a multi-function button, or pull-down
13 menu, 614. The multi-function button 614 can be used as a return button, a hide active links
14 button, and a restore active links button, for example. Alternately, several additional buttons
15 may be provided to select these features. The multi-function button 614 may be active when
16 the show links button 606 has been operated. In Figure 21, the components having underlying
17 links are "PorchScene by Cezanne" and "Cezanne." The component "PorchScene by
18 Cezanne" is shown with one link and the component "Cezanne" is shown with three links.
19 Also shown in Figure 21 is the link menu 971 that lists the links, or components, the link
20 number and a description of the linked material. For example, the material linked to the
21 component "PorchScene by Cezanne" is a JPEG video file showing the painting.

22 Once a link is selected, an on-screen return button 614 allows the subscriber to return
23 from the linked material back to the originally viewed text. The show links button 606 (see
24 Figure 20) can be displayed on the viewer 266 either at all times that an electronic book is
25 open, any time an underlying link exists, or only when commanded to do so from the viewer's
26 menu system 851.

1 When linked material is displayed (for example, in an overlay fashion) the subscriber
2 can command the linked material to be placed in a hidden state by operating the hide active link
3 button 614 or by use of the menu system 851. When an active link is hidden, the restore active
4 link button 614 is displayed. Operation of the restore active link button 614 will display the
5 material linked by the active link.

6 Alternatively, the on screen “Help” menu 887 (see Figure 13) provides access to
7 further assistance when selecting links. The Help menu 887 is accessed by operation of the on-
8 screen help button 612. Related link options will be available for display on the viewer 266 by
9 selecting the Help menu 887, using the cursor 745 to do so. The “Help” function allows the
10 subscriber to select which specific links to be displayed on-screen. The links when displayed
11 may be simply highlighted portions of text, or text in different colors. All links for the displayed
12 page can be selected to be displayed. Alternatively, by selecting a range of content in an
13 electronic book that may have multiple underlying links, only links associated with the
14 components within the selected range will be presented on the viewer 266 for the subscriber
15 to select the specific link desired. Alternatively, a fixed number of links may be selected to be
16 displayed on the screen at a time. Alternatively, only a certain type of link may be selected to
17 be displayed. The types of links that are available for display may be listed in a pop-up menu.
18 The subscriber can choose from this pop-up menu which of the links to display. For example,
19 the pop-up menu could list links for a dictionary and links to an Internet web site. The
20 subscriber could choose to display only the dictionary links. Figure 22 depicts the menu screen
21 981 used to manage the subscriber’s filtering of links to view.

22 Figure 23 is a logical representation of the components and links for the example first
23 component “Cezanne” shown in Figure 20. In Figure 23, the text block (page) 602'
24 containing the first component Cezanne 980 is shown linked to components in other electronic
25 files or documents. A first link 981 links Cezanne 980 to a reference material component 982,
26 which is an encyclopedic entry related to the artist. A second link 983 links Cezanne 980 to
27 a dictionary entry 984 that includes a pronunciation key for the artist's name. A third link 985

1 links Cezanne 980 to an audio clip 986, which provides an audio file describing the artist's life.
2 If the subscriber chooses the audio clip 986, the audio file will immediately begin playing and
3 will be broadcast on a speaker in the viewer 266, or the attached television or the attached
4 personal computer, as applicable. The subscriber can stop the playback by operating the hide
5 active link button 614.

6 The links described above may also function in two directions. A biography of
7 Cezanne could include a link to the JPEG file showing PorchScene. The JPEG file
8 PorchScene could be one of several still videos of the artist's work. This JPEG file could be
9 linked to an appropriate section of the Cezanne biography. Then, if the subscriber were
10 viewing the JPEG file for PorchScene, the subscriber could display the link to the biography
11 and, upon activating the link, have displayed that portion of the biography that discusses
12 PorchScene. In this example, the same link is used to display either the JPEG file or text from
13 the biography. The same hidden table can be used with the two electronic files (i.e., the
14 biography and the JPEG file). Alternately, each electronic file may have its own hidden table.
15 In this alternative, the same link may be referenced in each of the hidden tables.

16 In the discussion above, each first component is linked to one or more other
17 components. However, the other components (i.e., the second and third components, for
18 example) may also be linked together. In addition, other components linked to one first
19 component may be cross-linked to other components that are linked to a second first
20 component (identifying secondary or tertiary cross-links). For example, the JPEG file of
21 PorchScene referred to in Figure 21 may be cross-linked to the audio file-biography shown
22 in Figure 21. Displaying the JPEG file will result in a cross-link being identified that links the
23 JPEG file to the audio file.

24 The cross-link may be indicated by highlighting, underlining, outlining, using a bold or
25 an italics typeface, using a different font, and using different color text. If the cross-linked
26 material is selected, that material will then be displayed. In the example described above, the
27 JPEG video file that shows the painting PorchScene can be cross-linked with Cezanne and

1 its identity would be displayed on the viewer 266. The video file could be displayed full screen
2 or in a picture-in-picture format. The video file could also be displayed on the attached
3 television 259 or the personal computer 261 (see Figure 2). Finally, the video file could be
4 printed by sending the video data and a print command to a printer 262 attached to the home
5 system 258 or to the personal computer 261.

6 In the table previously shown, all the links for a number of electronic books were
7 provided in one hidden table. In an alternate arrangement, many hidden tables may be
8 provided. For example, each electronic book may be provided with a hidden table. In this
9 alternative, the many hidden tables could form a relational database of linked material. As an
10 example, several different electronic medical text books could each be provided with its own
11 hidden table. An electronic general medical encyclopedia could also be provided with a hidden
12 table. Terms that are listed in one of the several medical electronic text books could then be
13 linked, in a relational fashion to the electronic medical encyclopedia. The several electronic
14 medical text books could also be relationally linked to each other, to on-line databases and to
15 other electronic files. For example, an electronic medical text book could be electronically
16 linked to electronic books, databases and other electronic files maintained at a medical school's
17 library.

18 The hidden table (either for many electronic books, or individually for each electronic
19 book) may be provided by the central provider or distributor as an additional feature that is
20 paid for separately from purchasing an electronic book. The distributor may offer many
21 different levels of service, such as only linking material (components) stored on a viewer, only
22 linking material within a particular electronic book, or linking one or more electronic books to
23 electronic files outside the home system 258 (e.g., linking an electronic book to a database
24 maintained by the distributor at an Internet web site).

25 Downloading the most current links table for an electronic book from the operations
26 center 250 or the Internet web site 279 refreshes the hidden links table, that is, any new links
27 that have been generated by the operations center 250, for example, are added to the hidden

1 links table. The current links table may be downloaded in conjunction with downloading a new
2 electronic book. Alternately, the current links table may be provided periodically by the
3 operations center 250.

4 As noted above, links within electronic books may be self-contained in nature, where
5 all the material to be linked to is resident within the same electronic book file. Additionally,
6 links may also be provided between material residing on the viewer 266. Also, links may be
7 provided to material that currently resides on the home system 258, if separate from the viewer
8 266. Finally, links may be provided to material that must be accessed through a
9 communications network. For example, material that is ordered or downloaded from the
10 operations center 250 or the Internet web site 279 may be linked to the electronic book. On
11 screen menus can also be supported on the viewer 266 in the form of electronic book files,
12 serving as a book or product catalog or service catalog that allows the subscriber to link to the
13 operations center 250 or the Internet web site 279 to order additional electronic books or
14 products and services at any time by selecting the desired component from the text.

15 If the content that is to be linked to is currently not available on the electronic book
16 viewer 266, the viewer 266 may prompt the subscriber to decide whether to: 1) retrieve the
17 corresponding material immediately from the home system 258, the operations center 250, or
18 the Internet web site 279; 2) wait until the next communication opportunity with the home
19 system 258 or operations center 250 to retrieve the material; 3) commence direct outside
20 communications with another communications system (e.g., a telephone in a PSTN); or 4) stop.

21 In one embodiment, the first components on the viewer 266 are a Table of Contents
22 and List of Figures for a book. Making a selection from the Table of Contents and List of
23 Figures automatically links to and displays the selected page within the electronic book file. In
24 another embodiment, the first components on the viewer 266 may be an Index of an electronic
25 book. Selecting the desired topic and associated page will cause that page to be displayed on
26 the viewer 266. In yet another embodiment, the first component is a footnote or endnote.
27 When the footnote is selected, the viewer 266 provides a display of material that further

1 addresses the reference. In another embodiment, the first component is a word or phrase that
2 has a further definition or clarification associated with it. By selecting the first component, the
3 corresponding dictionary definition, foreign translation, or glossary entry will be displayed on
4 the viewer 266. The dictionary definition or foreign translation may also be provided via an
5 audio file. In this embodiment, electronic books can be bundled with other standard reference
6 material or alternatively, stand-alone reference material like dictionaries or encyclopedias may
7 be accessed from within multiple electronic book files.

8 In another embodiment, the first component is a reference to another electronic book
9 altogether. By selecting the first component, the selected book is displayed on the viewer 266.

10 In another embodiment, on-screen menu buttons will be displayed on the viewer screen 602
11 that allow for a quick link to the Table of Contents, Index, glossary, and other key electronic
12 book sections by simply selecting the item on the viewer screen 602 with the cursor 745. In
13 yet another embodiment, the selected first component links the subscriber to a book review or
14 series of book reviews, providing additional information to assist in the decision of selecting a
15 new electronic book. In another embodiment, the selected first component is a book title,
16 chapter title, or text in the body of a book that is linked to an audio file that serves as an audio
17 narration of the selection that is played on the viewer 266. In yet another embodiment, the
18 selected first component links to a video file (JPEG or MPEG) that can be displayed on the
19 viewer screen 602. Another embodiment is a first component that links to textual annotations
20 and notes that have been created by the subscriber.

21 One embodiment includes first or subsequent components that are electronic book titles
22 that, when selected, links the subscriber to the operations center 250 or the Internet web site
23 279 to allow for the ordering of the selected book. In a similar embodiment, the selected
24 component consists of a product that, when selected, link the subscriber to the operations
25 center 250 site or an Internet web site to allow for the ordering of the selected product. Lastly,
26 in another embodiment, the selected component is a topic on which there is a link to an
27 Internet-based discussion group that addresses the topic in more detail.

1 Another embodiment is a link to a world watch live server/site. When a link is
2 provided to link a word or phrase to a foreign language dictionary, the viewer 266 may display
3 a foreign language selection feature. The subscriber may then indicate which language to use
4 when activating the link. For example, an English word or phrase in the electronic book may
5 be linked to a French, Spanish or German dictionary. The subscriber may specify which of
6 these foreign language dictionaries to link to.

7 IX. Connection To World Watch Live

8 The viewer 266 may also be used to display live or recorded video. The video may
9 be distributed using a telecommunications system, including delivery using the Internet. Access
10 to video may be provided using links within an electronic book or on an electronic book menu
11 display.

12 A. Obtaining Video From Remote Sites, Communicating the Video to a Web 13 Site, and Streaming the Video To Users.

14 Figure 24 shows a system that provides video, audio and text data from remote video
15 sources such as videocassettes and television programs. Figure 24 shows remote sites 2102,
16 remote cameras 2104, videocassette 2106, compression devices 2108, 2114, digital storage
17 device 2110 and web site 2112. As shown in Figure 24, a video camera 2104 is used to film
18 activity at remote site 2102. As discussed below, numerous video cameras at a single remote
19 site may be used to obtain different views, text, and audio (for example, stereophonic) of the
20 remote site from different angles and orientations. Also, numerous remote sites, each with its
21 own video camera, may be used as shown at 2102', 2102" and 2104' and 2104". The video
22 cameras film events at the remote sites, and record the events on videocassette 2106 or other
23 suitable media.

24 The recorded information is then transported to a web site 2112, or to a site in
25 communication with the web site 2112. As shown in Figure 24, the recorded information from
26 video tape 2106 is then compressed in compression unit 2108 and stored in digital storage
27 media 2110. Many compression algorithms may be used, such as MPEG-1, MPEG-2 and

1 Wavelet. Compression systems currently available from The Duck Corp, Xing Technology
2 Corp., Indeo, Digital Video Arts, Ltd., VDOnet Corp. and Intel Corp., may be used with the
3 system. The digital storage media may be any known storage device, such as a hard disk, CD
4 ROM, digital video disc (DVD), digital tape, video file server or other media.

5 The stored and compressed data may then be provided on a number of streamed
6 audio-video outputs 2116 from the web site 2112. This enables many users to access the
7 stored video, text, and audio, and allows for one user to receive numerous audio-video signals,
8 i.e. split the display into numerous "camera" feeds.

9 In addition to providing streamed audio and video from videocassette, the web site
10 2112 may provide audio, text, and video from television channels. The television signals are
11 received by a conventional television receiver (not shown in Figure 24), and digitally
12 compressed by the compression unit 2114 and fed through the web site 2112 to the streamed
13 output. It is not normally necessary to store the television programs in a digital storage unit
14 (such as the storage unit 2110), since the audio, text, and video is constantly incoming and
15 changing. However, certain segments of broadcast television may be stored in a storage
16 device, such as the digital storage unit 2110, for recall by a user.

17 Figure 25 shows another system for supplying video, audio and text data, where similar
18 reference numerals indicate items that correspond to the items shown in Figure 24. The system
19 of Figure 25 uses remote cameras and a communication network to provide remote video to
20 the web site. Figure 25 shows remote sites 2102, video cameras 2104, compression unit
21 2118, data communication network 2120, web site 2130, digital storage unit 2132, and
22 streamed video 2116.

23 As shown in Figure 25, the remote sites 2102 are filmed by cameras 2104 (as in Figure
24 24). However, in this system, the outputs of the cameras 2104 pass through a compression
25 unit 2118. The compressed audio, text, and video is communicated over the data
26 communication network 2120 to the web site 2130. The data communication network 2120
27 may be any network currently known to one of ordinary skill in the art, such as land-leased

1 lines, satellite, fiber optic cable, microwave link or any other suitable network. These and other
2 delivery systems are described in more detail in Section VII.

3 Other suitable networks may be cellular networks or paging networks. In a paging
4 network, the cameras 2104 may be connected to a paging device and/or digital storage media
5 or paging transmitter for communication of the video (including text and still images -- as used
6 hereinafter, video refers to moving and still images, and to text data) to the web site 2130. The
7 following publications, hereby incorporated by reference, disclose relevant systems: PCT
8 Publication No. WO 96/07269, published March 7, 1996 by Jambhekar et al.; PCT
9 Publication No. WO 96/21173, published July 11, 1996 by Harris et al.; PCT Publication No.
10 WO 96/21205, published July 11, 1996 by Harris et al.

11 The web site 2130 in this example is adapted to receive information from the data
12 communication network 2120. The web site may pass the video from cameras 2104 to users
13 at streamed video outputs 2116. Alternatively, the web site may contain a decompressor to
14 decompress the video prior to streaming it to users, or change the compression scheme of the
15 video to one which is compatible with the connected user. Alternatively, the video may be
16 compressed at the streamed video output and users who connect to the web site 2130 may run
17 decompression software. The web site 2130 may store the audio and video received over data
18 communication network 2120 in digital storage unit 2132 before providing it to the streamed
19 outputs 2116. Alternatively, the audio and video may be directly passed to the streamed
20 outputs 2116.

21 Figure 26a shows another embodiment of the invention that combines the embodiments
22 of Figures 24 and 25 and adds remote camera control. Figure 26a shows remote sites 2102,
23 cameras 2104, computer 2134, video path 2122, 2129, control path 2124, 2126, 2128,
24 compressors 2108, 2114, 2118, 2136 data communication network 2120, web site 2140,
25 digital storage means 2132, and streamed video 2116. As with Figures 24 and 25, remote
26 sites 2102 are filmed by the cameras 2104. As with Figure 24, the web site 2140 is able to
27 receive data from the video tape 2106, compress the audio and video in the compression unit

1 2108, and store the compressed audio and video in the digital storage unit 2110. Audio and
2 video from television stations may also be compressed by the compression unit 2114 and
3 stored or passed as streamed video 2116, as in Figure 24.

4 Likewise, the cameras 2104 may be connected to the compression unit 2118 (as in
5 Figure 25) and communicate compressed audio and video to the web site 2140 via the data
6 communication network 2120. Thus the functions performed by the systems shown in Figures
7 24 and 25 may be combined in a variety of manners at the single web site 2140.

8 Figures 26a and 26b add the additional feature of camera control to the previously
9 described systems. As shown in Figure 26a, the computer 2134 is connected to the remote
10 cameras 2104. The computer is able to control a mechanical or electrical device on the
11 cameras 2104, to alter the cameras' orientation (including position and/or angle). Audio and
12 video from the camera 2104 passes to the computer 2134. The video may be processed and
13 stored in the computer. As shown in Figure 26b, the computer may be connected to multiple
14 remote cameras 2104' and 2104" so that multiple users may each control a camera. The
15 computer 2134 may either contain a compressor or be connected to an external compression
16 unit 2136. The video from cameras 2104' and 2104" is compressed and provided to data
17 communications network 2120. This compressed video is subsequently received by the web
18 site 2140. The remote cameras 2104', 2104" (Figure 26b) may be controlled by control signals
19 passed from the computer 2134 on the path 2124. The control signals are received by the
20 computer 2134 from the data communications network 2120 over the camera control path
21 2126. The web site 2140 provides the control information to the data communications
22 network 2120 over path 2128. The web site 2140 in this system is adapted to pass control
23 signals to the cameras 2104 and to store video images in the digital storage unit 2132. The
24 web site 2140 provides a number of streamed video outputs 2116.

25 The system shown in Figure 26a allows remote users to control the angle or orientation
26 of cameras 2104', 2104". Users are connected to the web site 2140 and receive the streamed
27 video 2116 from the cameras 2104', 2104". If the users wish to move the cameras 2104',

1 2104" to the right, they may enter a user command (such as "pan right") at their terminal. The
2 terminal may be an electronic book home system 258, a personal data apparatus (PDA) or a
3 personal computer, for example. The command is received by the web site 2140, and
4 formatted, if necessary. The command is outputted to the data communication network 2120
5 as a control signal through the camera control path 2128. The computer 2134 receives the
6 camera control signals from the communication network 2120 over the camera control path
7 2126. The remote computer 2134 may be adapted to control multiple cameras at multiple
8 locations 2102, or multiple cameras at the same location 2102.

9 When using the home system 258 to connect to a world watch live web site, the user
10 may enter commands using the viewer 266. In this embodiment, the viewer 266 may display
11 command options in a "soft key" format. The user initiates a command through use of a touch
12 screen device or a pointing device such as a track ball, for example. The user interface aspects
13 of the viewer 266 will be described later in more detail. The home system 258 and the viewer
14 266 may be adapted to display data from the world watch live web site 2140 by the addition
15 of software routines. The software routines may be contained on a computer-readable
16 medium, such as a floppy disk, for example. Alternatively, the software routines may be
17 downloaded to the home system 258 and the viewer 266 over the Internet from the web site
18 2140.

19 The computer 2134 is connected to the remote camera 2104 by a camera control path
20 2124. This path allows control commands from the computer to travel to the cameras 2104',
21 2104" and control the cameras 2104', 2104". The cameras 2104', 2104" may have computer-
22 controlled swivel motors (not shown) for panning left and right, may have a computer-
23 controlled pivot motor (not shown) for panning up and down, and may have a computer-
24 controlled motor (not shown) for moving a zoom lens. These motors are known to the artisan
25 and are currently available. A number of cameras may be provided at a single site to allow
26 multiple users to have camera control at the same time.

1 This system of obtaining and/or storing video at a web site is extremely flexible. The
2 system allows for perceived camera control by multiple cameras, actual camera control of one
3 or more cameras, perceived camera control via a wide-angle lens on a single camera, and for
4 the generation of comprehensive interactive programs.

5 B. Perceived Camera Control With Multiple Cameras

6 In an alternative system, shown more clearly in Figures 27 - 29, users are given the
7 perception of camera control. To achieve this, a plurality of fixed cameras 2104, 2150, 2152,
8 2153, 2154, 2156, 2158, 2160, 2162 (Figure 27) are disposed around a remote site 2102.
9 In accordance with this embodiment, it appears to users that they are controlling the angle or
10 position of a camera when in actuality they are merely being transferred to the video output of
11 a different camera. Figures 27 - 29 show this concept in greater detail.

12 As shown in Figure 27, a building 2146 is being prepared for demolition. Disposed
13 around the building 2146 are cameras 2104, 2150, 2152, 2153, 2154, 2156, 2158, 2160,
14 2162, connected to a computer 2135. The computer 2135 is connected to a communication
15 network 2120 (not shown). The video from cameras 2104, 2150, 2152, 2153, 2154, 2156,
16 2158, 2160, 2162 is digitized and preferably compressed prior to communication over
17 network 2120, either by compressors connected to the cameras (not shown) or by a
18 compressor connected to the computer 2135 (not shown). The cameras may be digital
19 cameras or analog cameras connected to an analog-to-digital converter.

20 The cameras specifically identified around the periphery are cameras 2150, 2152,
21 2153, 2154, 2156, 2158, 2160, and 2162. For reference, the building contains the letter "A"
22 and the letter "B" on two sides as shown at 2144 and 2148 in Figures 27 and 28a - 28d. A
23 number of additional cameras 2104 are disposed about the periphery of the building in a
24 circular pattern. The pattern and number of cameras are not critical, but will control how the
25 user perceives movement of the "camera".

26 Referring to Figure 27, a video camera 2150 faces side A, a video camera 2152 is
27 between sides A and B, a video camera 2153 faces side B and a video camera 2154 is

1 between side B and the side opposite side A. The video cameras 2156, 2158, 2160 and 2162
2 are disposed closer to the building, as shown. All the video cameras contain audio pickups
3 (preferably stereo). Additionally, all the video cameras are connected to a computer 2135
4 which outputs compressed audiovisual signals to the communication network 2120 and
5 consequently to the web site. The system shown in Figure 27 may be implemented by the
6 systems shown in either Figure 25 or Figures 26a and 26b. Any number of users in
7 communication with the web site 2130, 2140 may receive the audio and video from these
8 cameras.

9 Figure 28a shows a typical screen view 2150 of the video presented on the viewer 266
10 to remote users who are connected to the web site of the present invention. As shown, the
11 user is observing live video from camera 2150, which provides a view of the building on side
12 A. A “toolbar” of commands 2151 is presented to the user, including a pan left command “←”,
13 a pan right command “→”, a pan up command “↑” and a pan down command “↓”. An
14 “autopan” command is used in conjunction with another command (such as pan right). The
15 “autopan” command is used to automatically move the picture position in the direction
16 previously entered. For example, if “autopan” is entered after “pan right,” then the picture will
17 keep panning right until another key is pressed or a default key (such as the ESCape key) is
18 pressed. The speed of the “autopan” function is controlled by the “speed” command, which
19 is used in conjunction with the “+” and “-” commands. Additionally, the “+” and “-”
20 commands, when used alone, control a “zoom-in” and “zoom-out” function, respectively. The
21 “toolbar” commands are selected via a user input device, which may be a touch sensitive
22 screen, a keyboard, mouse, trackball, and a remote control.

23 When any user wishes to switch from the view of the camera 2150 (Figure 28a) and
24 pan to the right, the user initiates a pan right command “→”, which is transmitted to the web site
25 2130, 2140 (Figures 25 and 26a and 26b). The web site receives the command, and in
26 response, causes the video from the camera positioned to the right of the camera 2150, in this
27 case the video camera 2152 (Figure 27) to be transmitted to the user. The user then observes

1 the picture appearing in Figure 28b, which appears to be a view to the right from the previous
2 position (camera 2150). If the user continues to pan right, the user is presented with the Figure
3 28c view, received from the camera 2153. The user may continue to pan right all away around
4 the building in this manner.

5 Additionally the user has special functions available, such as "autopan" and "zoom."
6 For example, "autopan" in conjunction with "pan right" would cause the view of the building
7 to rotate, at a speed dictated by the "speed" function and the "+" and "-" keys. Using the
8 "+" and "-" keys alone causes the view to change to a closer camera ("+") or a camera further
9 away ("-"). As shown in Figure 27, the cameras 2156, 2158, 2160 and 2162 are disposed
10 closer to the building than cameras 2150, 2152, 2153 and 2154. A "magnified" image,
11 obtained from the camera 2156, is shown in Figure 28d. If no cameras are disposed closer
12 or further away, digital image processing may be used to digitally increase or reduce the size
13 of the image. The software which controls these functions may be disposed either at the web
14 server or on the user's computer.

15 Thus, users may obtain different views of the building 2146 as if they were remotely
16 controlling the positioning of a single remote camera. The users may observe the demolition
17 of the building from many exciting perspectives. This "perceived" camera control is
18 advantageous because it allows any number of users to "control" a camera. A single camera
19 which is remotely controllable is only controllable by a single user. Thus, the present invention
20 is suitable for large audiences. The realism of this perceived control is directly dependent upon
21 the number of cameras and their distances from the viewed object.

22 Therefore, when the building 2146 is demolished, any number of users may pan around
23 the building in real time as if they were actually present at the site. When the building is
24 demolished, the video cameras pick up, preferably in stereo, the sounds of the demolition.
25 Users who have loudspeakers connected to their computer may experience the demolition
26 almost as if they were present.

1 Figure 29 shows a deployment of a number of cameras 2104 which are arranged in a
2 linear fashion around a point of interest, each camera connected to computer 2135 as in Figure
3 27. As with Figures 27 and 28a and 28b, this embodiment uses “perceived” camera control
4 which may be achieved by the systems shown in Figures 25, 26a and 26b. In this example, the
5 remote location and point of interest is a parade, such as a New Year's Day Parade. With the
6 camera deployment shown, a user may traverse the length of the parade without actually being
7 present. Users may view whichever part of the parade they are interested in, for as long as
8 they desire, without worry that they have missed an interesting band or float. In this example,
9 the camera deployment merely follows the parade route. Parents who have children in a band
10 or float may search for the child and follow the child throughout the parade route, rather than
11 having to monitor every moment of the parade on television in the hopes that the child will pass
12 the reviewing camera when the parents are watching. The parents merely “move” from
13 different cameras along the parade route as their children progress in the parade.

14 C. Actual Camera Control of Single/Multiple Cameras

15 Figures 30a and 30b show another system, where a number of cameras 2160, 2162,
16 2164, 2166, are provided. These cameras are in direct communication with and are controlled
17 by computer 2170. Although it is possible to form a ring of cameras to perform “perceived”
18 camera control (as in Figures 27 - 29), the embodiment shown uses four cameras 2160, 2162,
19 2164, 2166 which contain motors 2105 (Figure 30b) for controlling the camera's positioning.
20 The motors are controlled by computer 2170. Either a single computer 2170 or a number of
21 computers 2170 may be used. The remote location and point of interest shown in Figures 30a
22 and 30b are, for example, a watering hole or desert oasis. Users who access the web site
23 2140 are able to observe live video of wildlife behavior at the watering hole. The cameras
24 2160, 2162, 2164, 2166 are disposed at an island in the middle of the watering hole. The
25 toolbar 2151 of Figure 28a is also used in this embodiment and enables users to choose
26 camera control commands to spin the cameras around or perform other camera functions, such

1 as zoom. Users are therefore able to receive different views and angles, and observe the entire
2 watering hole.

3 Figure 30b shows the control and video paths of the Figure 30a system combined with
4 system shown in Figures 26a and 26b. The video from cameras 2160, 2162, 2164, 2166 is
5 communicated to computer 2170, in compressed or uncompressed form on path 2122. The
6 computer 2170 communicates the video to communications network 2120 for reception by the
7 web site 2140 (Figures 26a, 26b). Preferably the video is digitized and compressed by either
8 the cameras 2160, 2162, 2164, 2166, the computer 2170, or an external analog-to-digital
9 converter (not shown) and compressor 2136 (Figures 26a, 26b) prior to transfer to the
10 communications network 2120.

11 Camera control commands are received by the computer 2170 on control line 2126,
12 as shown in Figures 26a, 26b and 30b. The commands are formatted, if necessary, by
13 computer 2170 and transferred to control units 2105 attached to cameras 2160, 2162, 2164,
14 2166. The control units 2105 are connected to spin, zoom, or otherwise control the cameras
15 as directed by the user.

16 Communications links 2124 and 2122 may be wired, wireless, digital or analog, and
17 computer 2170 may be located nearby or remote from the site 2102.

18 The system of Figures 30a and 30b are unlike the systems shown in Figures 27 - 29,
19 because each user is assigned a remote camera in the Figure 50a, 50b embodiment. Since
20 each user must be assigned their own controllable camera, users will have to contend for
21 available cameras. The number of controllable cameras may range from a single camera to any
22 number, and is preferably statistically determined to correlate to the average number of users
23 who access the web server 2140 at any given time or at peak times. The number of cameras
24 may be reduced by using known systems which utilize queuing, reservations, and time limits.

25 D. Perceived Camera Control Using A Single Camera And A Wide-Angle Lens

26 Figures 31a and 31b show another embodiment, using only a single camera, where an
27 unlimited number of users may view any portion of the remote site 2102. This embodiment

1 uses a spherical lens 2182 in optical communication with the camera 2180. The remote site
2 2102 shown in Figure 31a is a remote watering hole or oasis as in Figures 30a and 30b.

3 As shown in Figure 31a, a camera 2180 has a spherical (or other wide angle) lens
4 2182, which provides a 180°, spherical or other wide-angle view. This view, which is
5 communicated to a computer 2184, contains distortion. The computer 2184 communicates
6 and compresses the distorted video back to the web site 2130 or 2140 which stores and may
7 process the image. Rather than using the computer 2184, a simple transmitter may be used to
8 convey the entire spherical video to the web site 2130, 2140 (Figures 25 and 26a and 26b).
9 By using appropriate image processing software, the web site removes the barrel distortion and
10 stores data relating to the entire spherical view. Users may then access different portions of
11 the 180° sphere. In this embodiment, the toolbar 2151 of Figure 28a is also used. By using
12 the toolbar 2151, users may move across the spherical view and obtain the “perception” of
13 camera control. This embodiment is advantageous in that it can provide the perception of
14 camera control to any number of users simultaneously using only one remote camera.

15 Figure 31b shows alternative embodiments of the system shown in Figure 31a. As
16 shown in Figure 31b, the spherical (or other wide angle) lens 2182 is used with video camera
17 180", which conveys video information to computer 2184. Computer 2184 communicates the
18 video over communications network 2120 to the web site 2130. The web site 2130 may store
19 or process the received video, and make the video available to users at user terminals 2302,
20 2304, 2306, 2308, 2310 by communicating the video over communication network 2125.
21 Communication network 2125 is explained in more depth below with respect to Figure 33.

22 Because wide angle lenses generate distortion, processing is conducted on the distorted
23 image to remove the distortion from a segment of the image. This processing may be
24 performed at the computer 2184, or the web site 2130. Alternatively, the processing may be
25 performed at the user terminals 2302, 2304, 2306, 2308, 2310.

26 Thus, the web site 2130 has available wide angle video for sending to users. Users
27 display and view only a segment of the wide angle video at a time. Then, by using toolbar 2151

1 (Figure 28a), the user may select adjacent segments of the video for view. When a user selects
2 an adjacent segment of the video for display, the adjacent segment is processed to remove
3 distortion and then displayed. Displaying the adjacent segment gives the appearance that the
4 camera was physically “moved” to the adjacent side of the original segment.

5 One system for electronically removing the distortion from a segment of an image
6 obtained from a fish-eye lens is disclosed in U.S. Patent No. 5,185,667, issued February 9,
7 1993 to Zimmerman, incorporated herein by reference. Zimmerman’s apparatus uses the
8 following hardware for processing a captured and digitized image: a microcomputer connected
9 to a remote control, computer control, X-Map and Y-Map; an input image buffer connected
10 to the X-Map and Y-Map with an output connected to an image filter and an output image
11 buffer. This hardware, for example, or any other suitable hardware, may be placed at the
12 computer 2184, or the web site 2130, but is preferably located at the user terminals 2302,
13 2304, 2306, 2308, 2310.

14 Alternatively, the specialized hardware is removed and the hardware functionality is
15 implemented in software at the computer 2184 or web site 2130, but preferably the software
16 is loaded into the user terminal 2302, 2304, 2306, 2308, 2310. Thus, in accordance with the
17 present invention a spherical (or other wide-angle) image is supplied to the user’s terminal,
18 which executes appropriate software (which may be a “plug-in” for a browser application
19 program) for displaying a segment of the image (or video) without distortion. Additionally, the
20 distorted spherical image (or video) may be saved to a storage medium, either at the user’s
21 terminal or at the web site, for future loading and viewing.

22 Figure 31b also shows how to remove the lens distortion without special processing.
23 As shown in Figure 31b, a spherical (or other wide angle) lens 2182 is in optical
24 communication with a video camera 2180'. However, a nonlinear imaging sensor 2186 is
25 placed between the spherical lens 2182 and the video camera 2180'. The imaging sensor is
26 designed to provide a distorted output which cancels out the distortion of the spherical lens
27 2182, and thus an undistorted wide-angle image is provided to video camera 2180'.

1 Alternatively, imaging sensor 2186 may itself provide a digital output, making it unnecessary
2 to use a camera 2180'. In this case, the imaging sensor 2186 would be directly connected to
3 computer 2184.

4 Examples of imaging sensors 2186 are disclosed in U.S. Patent No. 5,489,940, issued
5 on February 6, 1996 to Richardson et al., and in PCT publication WO 96/12862, published
6 June 13, 1996 to Richardson et al., each incorporated herein by reference. Other suitable
7 imaging sensors may be used with the present invention.

8 The image obtained by the imaging sensor 2186 may be undistorted and not require
9 further processing. A segment of the image may then be selected for display by simply passing
10 the image data to a display device. If the imaging sensor is imperfect, further processing may
11 occur to correct for defects in the sensor. Additionally, further processing for "zoom" and
12 "unzoom" functions may occur. This further processing may take place at the web site 2130
13 or at the user's terminal 2302, 2304, 2306, 2308, 2310.

14 The embodiments of Figures 48a through 51b may be used in conjunction with either
15 live audio and video or prerecorded video data (with audio) (shown in Figures 24 - 26b). For
16 example, if nothing interesting is happening at the watering hole, a connected user may access
17 a stored audio and video clip of a lion attack which occurred the day before. If "perceived"
18 camera control is utilized, the stored audio and video preferably includes all camera angles (or
19 a wide-angle view), such that the ability to pan and zoom is preserved.

20 E. Web Site Configuration

21 Figures 52a and 52b show a more detailed view of the web site, listed as web site
22 2140 (Figure 28a), but which may also correspond to web sites 2112 (Figure 24) and 2130
23 (Figure 25). The web site 2140 is connected to a data communication network 2120, the
24 Internet 2242, and direct connections 2244. The web site contains transmission equipment
25 2210, receive equipment 2220, 2220', two compression units 2108, 2114, a web server 2200,
26 a router 2230, and communication equipment 2240. The web server 2200 itself contains a
27 digital matrix switch 2250, a plurality of digital video servers 2252, 2252', 2252", 2252"', a

1 firewall access control unit 2254, a database server 2256, an audio and video storage unit
2 2258, a data storage unit 2260, an administrative unit 2262, a digital matrix switch 2264, a
3 camera control unit 2268 and a digital video matrix switch 2270.

4 The web site 2140 is connected to the data communication network 2120 by
5 transmission equipment 2210 and receive equipment 2220. As shown, multiple receivers
6 2220, 2220' may be used. Also, as shown, the receivers may have more than one video
7 output. Audio and video signals may also be input to the web server 2200 by videocassette
8 (or other suitable recorded media) or simply by feeding in television programming. As with
9 Figures 24 and 26a, these signals are preferably compressed by compression units 2108,
10 2114. On the opposite side, the web server 2200 is connected to remote users by a router
11 2230 and communication equipment 2240, which in turn are connected to the Internet 2242
12 or directly connected 2244 to users. The communications equipment 2240 outputs the video
13 streams 2116 through a number of input/output ports.

14 As previously stated, the web server 2200 contains a digital matrix switch 2250, a
15 plurality of digital video servers 2252, 2252', 2252", 2252"', a firewall access control unit 2254,
16 a database server 2256, an audio and video storage unit 2258, a data storage unit 2260, an
17 administrative unit 2262, a digital matrix switch 2264, a camera control unit 2268 and a video
18 matrix switch 2270.

19 The digital matrix switch 2250 receives all incoming compressed video signals from the
20 receivers 2220, 2220' and the compressor units 2108, 2114. The matrix switch 2250 also
21 receives compressed video data from database server 2256. Under control of the
22 administrative unit 2262, the digital matrix switch 2250 outputs the input compressed video
23 signals to digital video servers 2252, 2252', 2252", 2252"'. In this manner, any input signal can
24 be transferred to any video server as directed by the admin unit. Also, stored programming
25 from the database server 2256 is routed to the digital matrix switch 2250 to be switched as if
26 it were incoming live video. The outputs of the digital matrix switch 2250 also connect to the

1 database server 2256, so that anything at the inputs, such as incoming live audio and video, can
2 be stored in the database server 2256.

3 The compressed input video is passed into various digital video servers 2252, 2252',
4 2252", 2252'" for formatting. Users who connect to web server 2200 preferably run their own
5 decompression software so that the no decompression need occur at the web server 2200.
6 As an alternative, the digital video servers may decompress the input video.

7 The audio and video from the video servers 2252 are passed through a second digital
8 (video) matrix switch 2270. Since switching has already occurred at the digital matrix switch
9 2250, the second video matrix switch 2270 is not required, but is desired for maximum
10 flexibility. It is also optimal where the number of users exceeds the number of video inputs, as
11 one input may be channeled to numerous connected users.

12 The matrix switch 2270 may contain a processor that joins different frames of video
13 and audio such that each output contains frames for multiple video pictures (including audio).
14 This enables users to receive split screen images of video and select an audio track for
15 playback (see Figure 37, discussed below). The split-screen images may be formed by using
16 known methods, which may differ depending on the type of compression used. For example,
17 digital images may be decompressed, combined with other decompressed images, and then re-
18 compressed; or the images may be decompressed and converted to analog, combined, and
19 then converted to digital and compressed for transmission.

20 The signals switched by the video matrix switch 2270 are preferably digital. This is
21 because the communicated video streams 2116 are preferably digital. It is preferred to process
22 all the signals in the web server in the digital domain to improve simplicity and maintain
23 maximum flexibility.

24 The various streams of video output from the video matrix switch 2270 are passed to
25 the firewall access control unit 2254 for output to the router 2230 and the communication
26 equipment 2240.

1 Using this system, any user may receive any signal present at any input, including stored
2 signals within audio and video database 2258 or data storage unit 2260. Additionally, any
3 compressed digital signal present at the input to digital matrix switch 2250 may be stored in the
4 audio and video storage unit 2258 or data storage unit 2260. This is advantageous in the
5 perceived camera control embodiment (Figures 27 - 31b) where the web server 2200 must
6 output a different video picture to the user upon user request. When the user request is
7 received by the web server 2200, the administrative unit 2262 directs the matrix switches 2250
8 and 2270 to output the correct video stream to the user. If the user is requesting stored video,
9 the administrative unit directs the database server 2256 to provide the video to digital matrix
10 switch 2250. If graphics or textual data are required, the administrative unit 2262 directs the
11 database server 2256 to output the text or graphics to digital matrix switch 2264.

12 Although shown as one functional box, the database server 2256 may be implemented
13 by using several servers and/or multiport servers. The audio and video storage unit 2258 and
14 data storage unit 2260 may be implemented by using many storage media of different types,
15 such as optical storage devices (i.e. CD-ROM), magnetic disks, magnetic tape, or memory
16 circuits (i.e. RAM/ROM). The number of units depends on the amount of stored data, the
17 number of users, and the desired output speed. The database server 2256 may be one or
18 multiple units. The audio and video storage unit 2258 stores (preferably compressed) audio
19 and video presentations, including all relevant camera angles. The video servers 2252 may also
20 be implemented as one or more servers and/or multiport servers.

21 The data storage unit 2260 is used to store information relating to audiovisual displays.
22 This information relates to the menu structure and screen displays communicated to connected
23 users. The stored information may also relate to specifically to the audio and video which is
24 currently being displayed and heard. For example, in the demolition embodiment of Figure
25 28a, a user may click on a "more info" icon, to obtain information on demolition. Such
26 information, which could include statistics on dynamite, for example, would be stored as text
27 or graphics in data storage unit 2260. The "more info" command would be transmitted to the

1 communications equipment 2240, pass through the router 2230, and the firewall access control
2 2254 to administrative unit 2262. The administrative unit 2262 then directs the database server
3 2256 to recall the relevant information, such as statistics on dynamite, from data storage device
4 2260 and pass the information to digital matrix switch 2264. The recalled information is then
5 passed to the firewall access control unit 2254, the router 2230, and the communication
6 equipment 2240 for transmission to the proper subscriber. The data may be combined with
7 audio and video in the firewall access control unit 2254, or be a separate transmission.

8 In the perceived camera control embodiment, the communication equipment 2240
9 forwards the user's command (such as "pan right") to the router 2230, which detects the
10 command and forwards it to the firewall access control unit 2254, which passes it to the
11 administrative unit 2262. The administrative unit 2262 controls the video being fed to each
12 connected user. The administrative unit 2262 also responds to user commands by instructing
13 either the matrix switch 2250 or the matrix switch 2270 to pass a different audiovisual signal
14 from another source (i.e. camera, for example, the camera to the right of the present camera)
15 to the connected user. If the user is receiving a stored image from database 2258, the
16 administrative unit instructs the database server 2256 to recall the appropriate video
17 signal.

18 In the actual camera control embodiment (shown in Figures 26a and 30a), commands
19 from the user (such as "pan right") are received by the communication equipment 2240 and
20 forwarded to the router 2230. The commands enter the web server 2200 via the firewall
21 access control unit 2254, and are passed to the administrative unit 2262. The commands may
22 be stored in the administrative unit 2262 or passed to the database server 2256. Either way,
23 the commands pass through the camera control unit 2268 which formats the commands as
24 necessary for remote camera control. The formatted commands are passed to the transmission
25 unit 2210. The transmission unit 2210 provides the commands to data communication network
26 2120 for reception at remote cameras and CPU 134 (Figure 26a).

1 In the system with the spherical (or other wide angle) lens(shown in Figures 31a and
2 31b), where the remote camera uses a spherical lens 2182, the administrative unit 2262
3 determines which segment or quadrant of the audiovisual image is to be supplied to the user in
4 response to the user's command. The spherical image may be stored in database 2258 prior
5 to being output to digital matrix switch 2250. The image is split into a number of sections,
6 which when combined form the entire 180° sphere. By using suitable image processing
7 software, the distortion is removed or minimized in each segment. The administrative unit 2262,
8 in response to a user command, determines which segment of the sphere should be sent to the
9 user. The administrative unit then directs the database server 2256 to retrieve and output the
10 correct segment to the digital matrix switch 2250. By controlling the digital matrix switch 2250
11 and video matrix switch 2270, the administrative unit 2262 is able to ensure that the user
12 receives the correct segment of the spherical image.

13 In one system the entire spherical (or other wide angle) video is communicated to the
14 user, and the distortion removed by software at the user's terminal. This minimizes the
15 complexity of the processing necessary at the web site 2140, and allows the user to store the
16 entire spherical (or other wide angle) video.

17 The communication equipment 2240 may be designed to automatically determine the
18 maximum data rate at which information can be transmitted to the connected users. The data
19 rate depends on the type of connection the web sites has with the user, and the type of
20 equipment the user is operating. The communications equipment may use the maximum data
21 rate possible as sensed from the user's communications. Alternatively, users may enter their
22 data rates when prompted by a menu screen, as shown in Figure 38 and described below. The
23 data rates are then stored in communications equipment 2240. The communications equipment
24 2240 may also compress the video streams prior to transmission using any known compression
25 algorithm. Additionally, the communications equipment may remove video frames, preferably
26 prior to compression, such that the resulting data rate is reduced to be compatible with the user.

1 Figure 32b is identical to Figure 32a, but contains an input interface 2225 and an output
2 interface 2235. The input interface 2225 is used to obtain digital video from other sources,
3 such as a paging system, cellular system, cable television system, etc. The output interface
4 connects the web site to other communications systems such as paging systems, cellular
5 systems, or cable television systems. In the case where the input interface connects to an
6 analog system, it contains suitable analog to digital converters (not shown). Also, where the
7 output interface connects to an analog system, it contains suitable digital to analog converters
8 (not shown).

9 For example, the input interface 2225 may obtain images or video from a paging
10 system, and the output interface 2225 may be connected to a paging system to broadcast video
11 or images to a selective call receiver. In this regard, the following publications are incorporated
12 by reference, each of which relates video/images to selective call receivers: PCT Publication
13 No. WO 96/07269, published March 7, 1996 by Jambhekar et al., PCT Publication No. WO
14 96/21173, published July 11, 1996 by Harris et al., and PCT Publication No. WO 96/21205,
15 published July 11, 1996 by Harris et al.

16 F. Communication To Electronic Book Home Systems

17 Figure 33 shows how the users are connected to the web site using home system 258,
18 and shows an example of a communications network 2125 (Figure 31b) in detail. The
19 connections shown in Figure 33 apply to the web sites of the previous figures, including the web
20 site 2112 (Figure 24), 2130 (Figure 25) and 2140 (Figures 26a and 32a). Figure 33 shows
21 a server platform 2200, the Internet 2242, two direct connection 2244, two traditional Internet
22 hosts 2272, 2274, two cable Internet hosts 2276, 2278, a satellite-based Internet host 2280,
23 a telephone dialup 2282, an ISDN channel 2284, a cable plant 2286, 2288, a satellite system
24 2290 and a plurality of connected user terminals. The user terminals shown in Figure 33 are
25 home systems 258 including electronic book viewers 266. However, the user terminals can
26 be any electronic device capable of receiving and displaying digital data including personal
27 computers, for example.

1 In operation, the web sites 2112, 2130, 2140 may communicate over the Internet 2242
2 to a number of different systems. These systems include the traditional Internet hosts 2272,
3 2274, the cable headend Internet host 2276 and the wireless Internet host 2277. The
4 traditional Internet host 2272, 2274 may be connected using a telephone line 2282 or an ISDN
5 channel 2284 to a plurality of home system 258. The cable Internet host 2276 may be
6 connected using a cable plant 2286 to a home system 258.

7 Alternatively, the web site is connected using a direct connection 2244 to a cable
8 headend Internet host 2278 or satellite-based Internet host 2280. The cable headend Internet
9 host 2278 communicates to a cable plant 2288 and a home system 258. The satellite-based
10 Internet host 2280 communicates using a satellite 2290 to a home system 258. These direct
11 connections 2244 enable a higher data rate and use a high speed cable modem.

12 The communications equipment 2240 (Figure 32a) may enable communications with
13 any type of user terminal, including the home system 258, no matter what the data rate or
14 system. User terminals with higher data rates will receive higher quality audio and video
15 images.

16 G. Screen Displays and Features

17 Figures 34 - 39 show examples of display pages that are shown at the home system
18 258. The pages and menus are stored in data storage unit 2260 (Figure 32a) as graphical
19 and/or textual information. The world watch live menu may be accessed using the menu system
20 858 shown in Figure 13.

21 Figure 34 shows an example of a home page 2400 that contains a number of
22 advertisements 2402, numerous web links 2404, a society link 2406, options for viewing
23 television programming 2408, a plurality of rapid access entry options 2409 including a world
24 watch live option 2410, and options for clubs 2412.

25 The advertisements 2402 are useful for the page provider to generate revenue. As
26 described previously, the system is designed such that television programming can be supplied
27 over the Internet. Users may view television programming by selecting the home page

1 television option 2408. The Magazines 2404 are used to provide information concerning
2 specific topics to the user. Users may join a society, having additional membership benefits,
3 through the “society” selection 2406. The world watch live feature 2410, part of the rapid
4 access entry options 2409, is selected when users wish to watch live video from remote sites.
5 The clubs shown in the club option 2412 are selected by users who wish to obtain information
6 related to common areas of interest.

7 Figure 35 shows a society menu 2406, selected from the Figure 34 home menu page.
8 As shown in Figure 35, there are options for world watch live 2420, is an advertisement 2402,
9 subscription information 2424, and numerous club options 2422. This screen and all the
10 functions selected in response to the displayed options may be provided on a subscription or
11 temporarily free basis.

12 Figure 36 shows one example of a world watch live menu 2440. This menu may be
13 used to select remote locations from which to observe live or prerecorded video. In this
14 example, a map of the world is presented with sites that are available to select for observing
15 live video. The screen indicates sites that are active 2442 or under construction 2444. This
16 menu also contains two advertisements 2402.

17 The world watch live embodiment allows connected users to visit virtually anyplace
18 in the world to learn more about its culture, geography, or environment. Coupled with
19 perceived or actual camera control and associated prestored video, textual and graphical
20 information, a powerful and inexpensive learning tool is realized. This is more closely shown
21 in Figure 37.

22 Figure 37 shows a menu 2450 that corresponds to the Egyptian site in Figure 36. This
23 screen concerns “Giza, Egypt”, and contains live video from five cameras. As shown in the
24 screen, there is camera one 2452, cameras two through five 2454, a “Map” option 2456, an
25 “About This Site” option 2458, an “About Egypt” option 2460, an “Upcoming Events” option
26 2462 and a “Remote Control” option 2464. Camera one 2452 is the default for the main
27 viewing camera. The user may select video image sizes and the number of images to be

1 displayed, limited by the equipment the user is operating. Video from cameras two through five
2 are supplied along with that from camera one to provide alternative sites and viewpoints about
3 the topic of the screen (i.e., Egypt).

4 In an embodiment, the information presented in Figure 37 may be accessed by
5 activating a link in an electronic book. The link may exist in an electronic book devoted to the
6 history and geography of Egypt. The link may exist in an electronic encyclopedia. The link
7 may exist as a text address (e.g., a HTML address). The link may also exist as a location or
8 an icon in the electronic history book or the electronic encyclopedia. When the link is
9 activated, video feed, either live or delayed, may be provided to the user's terminal (e.g., the
10 viewer 266, the personal computer 261, or the television 259, shown in Figure 2). The video
11 may be accompanied by audio data, text data and geographical data.

12 The "Map" option 2456 brings the user back to the world map (Figure 36) to select
13 additional sites. The "About This Site" option 2458 brings up text, graphics or additional video
14 concerning the site of Giza, Egypt. For example, a professor appears and talks about the origin
15 of the Sphinx (shown by camera 1). The embodiment shown in Figure 39 and described
16 below (interactive lecture) may be combined with the "About This Site" option. Additionally,
17 other video may be displayed in response to selection of "About This Site". Such video may
18 be a documentary of the Sphinx or discussion about the technology that historians estimate was
19 used to construct the Sphinx.

20 The "About Egypt" option 2460 brings up graphics, text or additional video concerning
21 Egypt. For example, a map of Egypt with population densities may be shown. The option for
22 "Upcoming Events" 2462 brings graphics, text or video concerning new events in Egypt. For
23 example, text and newspaper articles concerning the construction of new irrigation canals is
24 displayed.

25 "Remote Control" option 2464 brings up a command menu (such as the "tool bar"
26 2151 of Figures 28a - 28d) that allows the user to change camera angles or positioning in any
27 of the cameras capable of that effect. The menu would apply to actual or perceived camera

1 control. For example, the user could pan around the Sphinx (camera 1, shown at 2452) to
2 observe it from the front, each side, and back.

3 Thus, this single screen relating to Egypt provides a wealth of information at a single
4 Internet address (or web site). The user may, but need not, "link" to other locations on the
5 Internet. Audiovisual presentations are displayed, which give the user insight into the people
6 and culture of Egypt. Text, graphics, and additional stored video is available to further educate
7 the user. Camera control (actual or perceived) gives the user the feeling of walking around
8 different locations in Egypt.

9 Figure 38 shows a screen 2470 that asks users about their equipment in order to
10 determine the appropriate data rate for communications. Preferably the screen is not needed
11 and the data rate is determined by communication equipment 2240 automatically. Note that
12 an advertisement 2402 is also shown on this screen.

13 Figure 39 shows an interactive lecture system. As shown in Figure 39, live video 2500
14 of an astronomy professor's lecture is transmitted to connected users. The users are able to
15 ask the professor questions 2510 and receive answers 2512. The live video 2500, questions
16 2510, and answers 2512 are shown to all connected users. The users may enter questions via
17 keyboard or microphone. However, if suitable data rates are available, the user may ask a
18 question via video. Thus a split screen video showing both the person asking the question and
19 the lecturer may be presented to all users simultaneously. The answers are preferably given by
20 the lecturer, who may observe the question on a remote display. Alternatively, the answers
21 may be supplied by the web site as text, graphics, or prestored video. The answer may pass
22 through a closed captioning device, be encoded, and displayed on the screen in an answer box
23 2512. Other techniques for two-way video communication are described in co-pending U.S.
24 Patent Application Serial No. 09/391,461 entitled VIDEO CONFERENCING USING AN
25 ELECTRONIC BOOK VIEWER, filed September 8, 1999, the disclosure of which is hereby
26 incorporated by reference.

1 Referring to Figure 32a, questions are sent to the web site 2140 as part of the normal
2 user terminal communication. The web site 2140 receives the question at the communications
3 equipment 2240 and forwards the question through router 2230 and the firewall/ access control
4 unit 2254 to the administrative unit 2262. The administrative unit 2262 determines whether the
5 question can be answered by playing stored video or showing stored text or graphics. If so,
6 the administrative unit 2262 directs the database server 2256 to recall the appropriate
7 information. The information is then output through the matrix switches 2250, 2270 or 2264,
8 under control of the administrative unit, as appropriate. The ability of the administrative unit to
9 answer questions depends upon the complexity of its software. Simple, prestored answers to
10 frequently asked or standard questions may be provided in a basic system. More advanced
11 systems may utilize an interpreter to analyze the question before providing an answer. For
12 example, frequently asked questions in the astronomy field may be “what is a star”? or “how
13 was the galaxy formed”? In response to these questions, which may be provided on a menu
14 or list, the administrative unit recalls prestored answers in either video, text, or graphics.

15 If a question cannot be answered by the administrative unit, or is sent directly to the
16 remote lecturer, the question proceeds to the remote lecturer in a similar fashion as the camera
17 control signal (Figure 26a) discussed previously. However, in the interactive lecture
18 embodiment, the camera control unit 2268 (Figure 32a) is replaced with a question format unit
19 (not shown) which reformats the question under control of the administrative unit 2262.
20 Transmitter 2210 then transmits a question signal to the location of the remote lecture via the
21 data communication network 2120 and the communication paths 2126, 2128. The lecturer has
22 a display which shows questions received over the data communication network.

23 In an alternative system, the lecturer or a number of assistants may select from among
24 many prestored answers in response to a question. In this system, the remote lecturer has a
25 computer and monitor (not shown) which displays the questions and the available prestored
26 answers. The lecturer or assistants then match answers with the questions. The prestored
27 answers are preferably forwarded to the individual who asked the associated question. In

1 order for others to learn from the questions, the questions and answers may be provided to all
2 connected users.

3 Figures 40 and 41 show a system that uses a combination of live video, stored video,
4 stored graphics, camera control and interactive questioning. The live video 2550 of camera
5 1 shown in Figure 40 relates to a geological site, i.e., the geyser, "Old Faithful." Since the site
6 is located on a National Park, the display screen has been customized to allow for the selection
7 "About National Parks" 2604. When this is selected, the user's command is communicated
8 to the web server 2112, 2130, 2140 for analysis by the administrative unit 2262. The
9 Administrative unit 2262 determines that prestored video and graphics are required, and
10 instructs the database server 2256 to output the correct information: video to the matrix switch
11 2250, and graphics to the matrix switch 2264. The matrix switches, 2250, 2270, and 2264,
12 under control of the administrative unit 2262, forward the video and graphics to the user
13 through the communication equipment 2240.

14 Figure 41 shows the result at the user terminal. The communicated prestored video
15 2560 of a Park Ranger appears on the screen. The Park Ranger discusses the topic of
16 National Parks. The discussion occurs in conjunction with a graphical display of the locations
17 of all National Parks, shown at the screen location 2570.

18 The user may select other options, such as "Map 600" to return to the map of all
19 remote sites, "About This Site" 2602 to learn more about the site currently viewed, "More
20 About National Parks" 2614 for even more information about National Parks, "Upcoming
21 Events" 2606 for a schedule of upcoming events, "Remote Control" 2608 for remote (either
22 actual or perceived) control of the camera (i.e. camera 1), "Ask Questions" 2610 for asking
23 questions (as in Figure 39) to an on-line Park Ranger, and "Other Topics" 2612, for a list of
24 other topics and/or options.

25 H. Surveillance Systems

26 The remote camera systems discussed above may be used in a surveillance or tracking
27 system. For example, a researcher may place a video camera in the center of a watering hole,

1 preferably connected to a video recorder for storing many hours of activity at the watering hole.
2 Multiple cameras or a wide-angle lens may be used such that virtual camera control (as
3 described previously) may be performed on the video. Such a surveillance system has many
4 advantages.

5 First, the surveillance system allows for automatic scanning of the surveyed area,
6 without the need for moving any cameras. Additionally, viewing multiple segments of the area
7 under surveillance may be viewed at the same time in a split-screen or multi-screen image. All
8 that needs to be done is the removal of distortion in multiple segments of the video (if using a
9 wide-angle lens). The disclosure of U.S. Patent No. 5,359,363, issued October 25, 1994 to
10 Kuban et al., incorporated herein by reference, discloses one example usable with the
11 surveillance system.

12 Second, automatic monitoring and/or tracking may be performed. Often, researchers
13 and photographers wait through long periods of inactivity before a desired event occurs. For
14 example, a photographer may wait for hours for a lion or other wildlife to approach the
15 photographer's position. The system may be used to automatically monitor a remote region
16 for activity. In this case, a processor may monitor the multiple cameras or the digital wide-
17 angle video for pixel changes indicating the desired event. For example, an approaching lion
18 in an otherwise inactive desert environment will cause a moving pattern to form on a camera's
19 output or in the wide angle image. A processor may detect the pattern and alert a wildlife
20 researcher that an event is occurring.

21 Further, the processor may automatically and continually display the relevant camera
22 output, or the segment of the wide angle image containing the lion, thereby tracking the lion.
23 Thus, the present invention may employ tracking techniques, known in the prior art, to the
24 obtained digital image.

25 In the monitoring and tracking embodiment distortion may be removed from the wide
26 angle image prior to performing the processing to determine whether an event is occurring. The
27 type of event being monitored and nature of the object being tracked controls whether

1 monitoring and/or tracking may be performed on the distorted or undistorted image. One of
 2 ordinary skill in the art will choose the system best suited for the particular monitored event or
 3 tracked object.

4 Figure 42 shows a flow diagram of a monitoring and tracking system. The software
 5 necessary to perform the monitoring/tracking functions may be located at the web site or at the
 6 user's terminal, such as the home system 258 and viewer 266. The image/video signal to be
 7 processed for monitoring and/or tracking may be a live video feed or be played back from
 8 stored video. Thus, a wildlife scientist may leave multiple video cameras running overnight (or
 9 a single video camera with a wide-angle lens) and when the video tape is played back, the
 10 segments/cameras containing activity are displayed.

11 Referring to Figure 42, an "input frame of reference" routine 2700 is executed. This
 12 routine is optional, and is used to establish a frame of reference direction, such as north. The
 13 frame of reference may determine the first segment of a wide-angle image to view, or the first
 14 camera to view. Next, a "reset segment counter" routine 2710 is executed. This sets the
 15 segment or camera to be first displayed.

16 Each segment or camera is viewed only for a limited time, prior to viewing the next
 17 segment or camera. Thus, a "reset timer" routine 2715 is executed to reset the interval when
 18 segments or cameras are switched.

19 Next, the "obtain image" routine 2720 is executed. This routine obtains the wide angle
 20 image (live or prerecorded), or images from all the cameras (in the multiple camera perceived
 21 control embodiment of Figures 27 - 28d). The obtained image from a wide-angle lens may be
 22 processed to remove the distortion or not, depending on what is being monitored.

23 The obtained image is processed to determine active areas (cameras or segments).
 24 Active areas are areas where the processor determines that activity is taking place, either by
 25 changes in the pixels at those locations, by using other known image/video processing
 26 techniques, or by using external sensors. The processing is performed as known in the art and
 27 is not described further herein. The processing occurs during the "process for activity" routine

1 2730. This routine uses the frame of reference to determine which segment(s), relative to the
2 normal (i.e., north) is/are active.

3 If activity is present, the “display active segments” routine 2750 displays the active
4 segments or cameras on a display. Distortion from the relevant segments is removed in the
5 wide-angle lens embodiment. If more than one segment is active, a split screen display may
6 show each segment simultaneously. The split screen display may make reference to the frame
7 of reference that was previously entered during routine 2700. The “reset timer” routine 2710
8 is then executed so that the last segment under view is returned when activity is no longer
9 present.

10 If activity is not present, the “display current segment” routine 2760 is executed. This
11 routine displays the current segment or camera until the timer expires, at which point the next
12 segment or camera is displayed. The display may make reference to the frame of reference
13 which was previously entered during routine 2700.

14 After displaying the current segment or camera, the “time limit exceeded” routine 2770
15 is executed. If the time limit has not been exceeded, a branch to the “obtain image” routine
16 2720 occurs and processing continues until the time limit is exceeded, or until activity occurs.
17 In an “autopan” embodiment (Figure 28a), the time limit value may be increased by pressing
18 the “-” button in conjunction with the “speed” button (Figure 28a), for a slower autopan, and
19 the time limit may be decreased by pressing the “+” button in conjunction with the “speed”
20 button (Figure 28a) for a faster autopan.

21 If the time limit is exceeded, the segment (or camera) counter is incremented by the
22 “increment segment counter” routine 2780. If the counter is greater than the maximum number
23 of cameras or segments, the “counter > max” routine 2790 branches to the “reset segment
24 counter” routine 2710, to restart the automatic panning. If the counter is not greater than
25 allowed, a branch occurs to the “reset timer” routine 2715 so that the next segment or camera
26 may be displayed, and processing for activity continues.

1 Thus, the flow chart of Figure 42 allows for automatic panning and for automatic
2 tracking. If the “process for activity” routine 2730, the “activity?” test 2740, and the “display
3 active segments” routine 2750 were removed, the “autopan” function described previously and
4 shown with respect to Figure 28a - 28d would be achieved. In this case, “display current
5 segment” routine 2760 would follow “obtain image” routine 2740.

6 Monitoring and automatic panning may be combined. When combined, all active
7 segments or cameras are automatically panned for a brief timeframe. Thus, if a lion and zebra
8 are both moving towards the camera from opposite direction, each would be displayed for a
9 brief timeframe before switching to a display of the other. This is an alternative to the split
10 screen display previously described.

11 I. Display of Video Data

12 In the systems described above, the user may select or be provided data concerning
13 the video currently displayed. For example, superimposed on the video may be the date and
14 time the video was recorded, a name of the image location, remaining time for the video, or
15 data pertaining to the segment (or camera source) of the video which is currently being viewed.

16 This segment/camera data may be a compass heading (such as north) or angle from a
17 reference (such as 40 degrees), or coordinate information (such as X/Y, X/Y/Z, R/Θ, and
18 X/R/Θ) relating to the location of the center of the segment/video currently displayed in relation
19 to the wide angle image or other cameras. A graphical representation of the lens (or layout of
20 the cameras) may show which segment of the wide angle image (or camera) is being displayed.

21 In order to display the image segment, a frame of reference may be adopted, especially for a
22 spherical lens. The frame of reference would be either generated by a processor at the web
23 site or user’s terminal, or entered by a user or operator. For example, the user may select
24 which direction is “north” or position the axis of a coordinate system if a coordinate display is
25 to be used for a particular lens.

26 Additionally, the image’s magnification and its density/colors may also be shown on the
27 display, such as “magnification = 10x, picture density = 200x200 pixels, 64 colors.”

1 The display of image data may be used in all embodiments of the present invention, and
2 are preferably updated when the displayed image changes.

3 Figure 43 shows a display 2800 showing a coral reef 2805 where users have virtual
4 camera control using multiple underwater cameras. On the screen 2807, the date 2810 is
5 displayed along with the time 2820. The location is shown at 2830 and the remaining time of
6 the program at 2840. The magnification is shown at 2850 and the density and colors at 2860.
7 The segment camera field 2870 shows that the user is viewing camera no. 3. This
8 segment/camera data may be shown graphically, as depicted at 2880. Field 2880 is a top view
9 of the coral reef 2805 and the layout of the cameras, in this case cameras 1 through 10. The
10 square around camera no. 3 indicates that this camera is the source of the picture on the display
11 2800. The frame of reference (north) is indicated at 2890 for the graphical segment data and
12 2895 for the video data.

13 J. Storing Video and Interactive Presentations.

14 The images, video, and image data may also be stored at the user's terminal. The wide
15 angle distorted image may be stored, along with the image data, if present. Storage of the
16 image and image data enables the user to retrieve the image and view a segment at a later date.
17 Optionally, the entire interactive presentation may be stored at the user's terminal (including
18 associated graphics, text, video, data, or other information), although all the pertinent files and
19 data would have to be received by the user.

20 The disclosure of PCT Publication No. WO 96/08105, published March 14, 1996 by
21 Labun, incorporated herein by reference is related to storing images and may be used with the
22 present invention.

23 The video or image may be stored in either its distorted or undistorted state. Storing
24 the video or image in its undistorted state has the advantage in that tall and/or wide pictures may
25 be stored in their most viewable state, and in that editing may be performed on the images more
26 easily if they are retrieved with the distortion removed.

1 The artisan of ordinary skill will appreciate that other aspects of the patent applications,
2 patents and publications incorporated herein by reference may be applied to the present
3 invention. As such, the patent applications, patents and publications are incorporated herein
4 in their entirety. The terms and descriptions used herein are set forth by way of illustration only
5 and are not meant as limitations. Those skilled in the art will recognize that numerous variations
6 are possible within the spirit and scope of the invention as defined in the following claims.

1 CLAIMS:

2 1. An apparatus for communicating audio and video signals to an electronic book viewer, the
3 apparatus comprising:

4 a web site, connected to a plurality of electronic book viewers, comprising:
5 a receiver that receives digitally compressed audio and video;
6 an audio-video server that provides a plurality of digital video signals;
7 a switch that switches and combines the plurality of digital video signals;
8 an administrative unit, connected to the switch that directs which signals are
9 switched and combined; and
10 a transmitter, connected to the switch that communicates the digital audio and
11 video signals to the electronic book viewer as video streams.

12 2. The apparatus of claim 1, wherein the web site further comprises:

13 an audio and video storage device, connected to the receiver that stores at
14 least some received audio and video;

15 a data storage device, connected to the receiver that stores textual and
16 graphical data;

17 a database server, connected to the administrative unit, the switch, the audio
18 and video storage device and the data storage device;

19 wherein the administrative means directs the database server to retrieve and supply to
20 the switch the audio and video information from the audio and video storage device and the
21 textual and graphical data from the data storage device.

22 3. An apparatus providing the perception of remote camera control to a user, the apparatus
23 comprising:

24 a plurality of remote video cameras arranged to film a remote site, each remote video
25 camera providing a video signal of a different perspective of the remote site;

1 a compressor, connected to the video cameras, that compresses the video signals;
2 a data communication network, connected to a web site and to the compressor, that
3 carries the compressed video signals from the remote site to the web site;
4 the web site connected to the communication network and to electronic book viewers,
5 comprising:

6 a receiver, having the compressed video signals as its input;
7 an administrative unit that determines which video signals to pass to a user
8 terminal in response to a user command;

9 a switch, controlled by the administrative unit, for switching received video
10 signals to communication equipment;

11 communication equipment, in operative communication with the administrative
12 unit, for transmitting the switched video signals to user terminals and for receiving a user
13 command;

14 wherein an electronic book viewer transmits the user command to the web site and the
15 administrative unit directs the switch to provide video signals to the electronic book viewer in
16 accordance with the user command thereby enabling a user to remotely control the position or
17 orientation of the video signal being received at the electronic book viewer by entering user
18 commands.

19
20 4. A system for providing a user with perceived camera control via an Internet web site,
21 comprising:

22 communications equipment to receive camera control commands from one or
23 more connected users and to transmit video to the one or more connected users;

24 electronic book viewers to receive the transmitted video and to transmit
25 camera control commands;

26 video of different views of a remote site;

1 an administrative unit, wherein the administrative unit determines which view
2 of the remote site to transmit to a connected user in response to a received camera
3 control command, thereby providing the connected user with the perception of camera
4 control.

5 5. The system of claim 4, wherein the system further comprises a video storage unit,
6 wherein the video storage unit supplies video of different views of the remote site to the web
7 site.

8 6. The system of claim 4, wherein the video of different views of the remote site is video
9 of different camera angles of the remote site.

10 7. The system of claim 4, wherein the video of different views of the remote site is a
11 distorted wide angle video of the remote site, and wherein the system further comprises a
12 means for removing distortion from at least one view of the wide angle video.

13 8. A system for providing a user with actual camera control, the system comprising:
14 a web site, comprising:
15 communications equipment to receive camera control commands from one or
16 more connected users and to transmit video to the one or more connected users;
17 a video receiver for receiving video from a remote video camera;
18 a transmitter in communication with the remote video camera;
19 a camera control unit, which outputs formatted camera control commands to
20 the transmitter; and
21 wherein the camera control commands received from a user are formatted and
22 transmitted to the remote camera and control the remote camera.

1 9. A method of remotely viewing a remote site, the method comprising the steps of:
2 accessing a communications network;
3 receiving video depicting one or more views of the remote site via the communications
4 network;
5 entering commands regarding a different view of the remote site;
6 displaying the different view of the remote site.

7 10. The method of claim 9, wherein the communications network is the Internet, and further
8 comprising the steps of:
9 addressing a web site on the Internet;
10 selecting a remote site.

11 11. The method of claim 9, wherein the received video is distorted wide angle video, and
12 wherein the step of displaying comprises the step of removing distortion from a segment of the
13 distorted wide angle video pertaining to the different view to be displayed.

14 12. The method of claim 9, wherein the received video is video from one of a plurality of
15 remote cameras, and further comprising the steps of:
16 processing the entered command to select one of the remote cameras in accordance
17 with the commanded different view; and
18 receiving video of the different view from the selected remote camera.

19 13. The method of claim 12, wherein the displaying step further includes the step of
20 indicating the location of the selected remote camera and a frame of reference at the remote
21 site.

1 14. The method of claim 13, wherein the step of indicating further comprises the step of
2 graphically displaying a layout of cameras at the remote site with respect to the frame of
3 reference.

4 15. The method of claim 9, wherein the displaying step further includes the step of
5 indicating the location of a frame of reference at the remote site.

6 16. The method of claim 9, wherein the displaying step further includes the step of
7 indicating data concerning the video, the data selected from the group consisting of: remote site
8 location, remote site time.

9 17. The method of claim 9, wherein the displaying step further includes the step of
10 indicating data concerning the video, the data selected from the group consisting of:
11 magnification, pixel density of the video, number of colors in the video.

12 18. The method of claim 9, wherein the entered command is a command to monitor the
13 remote site, the method further comprising the steps of:
14 processing the video for activity at the remote site;
15 and wherein the step of displaying includes the step of:
16 selecting views of the remote site displaying activity if activity is present.

17 19. The method of claim 18, wherein the step of displaying further includes the step of:
18 automatically panning the remote site if activity is not present.

19 20. The method of claim 18, wherein the received video is wide angle distorted video, and
20 the step of processing includes the step of removing distortion from at least a portion of the
21 received video to detect whether activity is present.

1 21. The method of claim 20, wherein the step of selecting includes the step of choosing
2 segments of the wide angle video for viewing, and the step of displaying further includes the
3 step of removing distortion from the chosen segments.

4 22. The method of claim 18, wherein the received video is video from a plurality of
5 cameras, and the step of selecting includes the step of choosing one or more cameras for
6 viewing if activity is present.

7 23. The method of claim 18, wherein the entered command is a command to automatically
8 pan the remote site, and wherein the step of displaying further includes the step of incrementally
9 viewing, for a fixed time, a plurality of different views of the remote site.

10 24. The method of claim 23, further comprising the step of:
11 selecting whether to increase or decrease the fixed time.

12 25. The method of claim 9, further comprising the steps of:
13 receiving data and graphics concerning the remote site;
14 and where the step of displaying further comprises the step of showing the data and
15 graphics.

16 26. The method of claim 25, further comprising the step of saving the video, graphics, and
17 data in a storage media.

18 27. The method of claim 9, further comprising the step of saving the video, graphics, and
19 data in a storage media.

20 28. An electronic book, comprising:

1 a link to an Internet web site, the web site providing a plurality of streaming video,
2 audio and text data when connected to the electronic book; and

3 a control function, wherein the control function allows selection of one or more of the
4 plurality of streaming video, audio and text data, and wherein the selected data are displayed
5 with display of the electronic book.

6 29. The electronic book of claim 28, wherein the electronic book is adapted to be
7 displayed on an electronic book viewer.

8 30. The electronic book of claim 28, wherein the electronic book is adapted to be
9 displayed on a television.

10 31. The electronic book of claim 28, wherein the electronic book is adapted to be
11 displayed on a personal computer.

12 32. The electronic book of claim 28, wherein the electronic book is adapted to be
13 displayed on a palm-sized viewer.

14 33. The electronic book of claim 28, wherein the control function, comprises:
15 a camera selection control that allows a user to select a camera angle from which is
16 provided a video signal; and
17 a multiple screen function that provides for display of video signals from more than one
18 camera angle.

19 34. The electronic book of claim 33, wherein the video signals are tiled for display.

1 35. The electronic book of claim 33, wherein the a first video signal is provided in a
2 picture-in-picture format with a second video signal.

3 36. The electronic book of claim 28, wherein the electronic book is stored on a device
4 having a memory, and wherein one or more of the streaming video, audio and text data are
5 stored in the memory.

6 37. The electronic book of claim 28, wherein the one or more of the plurality of streaming
7 video, audio and text data are provided live with display of the link in the electronic book.

8 38. The electronic book of claim 28, wherein the connection to the Internet web site is
9 completed using a wired communication system.

10 39. The electronic book of claim 28, wherein the connection to the Internet web site is
11 completed using a wireless communication system.

12 40. The electronic book of claim 28, wherein the connection to the Internet web site uses
13 an electronic link.

14 41. A computer-readable medium for controlling a connection between an electronic book
15 viewer and a world watch live site, comprising:

16 an interface module that receives user inputs, the inputs comprising commands to select
17 a viewing segment;

18 a memory module coupled to the interface module that directs storage of the received
19 inputs;

1 a transmission module coupled to the memory module that transmits the stored inputs
2 to a remote location; and
3 a receiving module that receives video and audio data from the selected viewing
4 segment.

5 42. The computer-readable medium of claim 41, wherein the world watch live site is an
6 Internet web site.

7 43. The computer-readable medium of claim 41, wherein the commands comprise:
8 a camera pan command;
9 a camera select command;
10 a camera off command;
11 a zoom command;
12 a camera on command; and
13 a camera tilt command.

14 44. The computer-readable medium of claim 44, further comprising a display module
15 coupled to the receiving module that displays the selected viewing segment.

16 45. The computer-readable medium of claim 44, wherein the receiving module receives
17 multiple selected viewing segments and the display module displays the received multiple
18 viewing segments simultaneously.

19 46. The computer-readable medium of claim 44, wherein the viewing segments comprise
20 different views of the world watch live site.

1 47. The computer-readable medium of claim 41, wherein one or more of the viewing
2 segments comprises a wide angle segment, the computer-readable medium further comprising
3 a video correction module coupled to the display module that removes distortion from the wide
4 angle segment before display.

5 48. The computer-readable medium of claim 41, wherein the video and audio data are
6 saved in a memory.

7 49. An electronic book, comprising:
8 a data file;
9 a graphics file;
10 interactive files;
11 electronic links included in the data file and the graphics file, wherein the electronic links
12 couple the electronic book to the interactive files, the interactive files, including:
13 an input file to receive commands and data, and
14 an output file to provide prompts and instructions and to provide the input file;
15 and
16 a control program that operates to couple the electronic book to an interactive file upon
17 activation of an electronic link.

18 50. The electronic book of claim 49, wherein the interactive file is displayed on an
19 electronic book viewer.

20 51. The electronic book of claim 49, wherein the interactive file is a world watch live site.

21 52. The electronic book of claim 49, further comprising an interactive file menu, the
22 interactive file menu including a link to the interactive file, wherein the menu includes a list of

- 1 available interactive files, and wherein activation of the link connects the menu to the interactive
- 2 file, the interactive file being displayed on a screen of an electronic book viewer.

ABSTRACT

An electronic book selection and delivery system distributes electronic text and graphics to subscribers. The system contains an operations center, a video distribution system or a variety of alternative distribution systems, a home subsystem, and a billing and collection system. The operations center and/or distribution points perform the functions of manipulation of text data, security and coding of text, cataloging of books, message center, and uplink functions. The home subsystem connects to a video distribution system or variety of alternative distribution systems, generates menus and stores text, and transacts through communicating mechanisms. A portable book-shaped viewer is used for viewing the text. The viewer can receive digital video data from a variety of sources, including the Internet by wired or wireless connections. The viewer may use the Internet connection to control and receive multiple line video feeds such as from a world watch live system. Users may be able to view a plurality of remote locations in real time and remotely control a video picture of a distant location. The remote control may be either actual control of a remote video camera or perceived remote control by the manipulation of audiovisual data streams. Text, graphics, and other video information supplement one or more video pictures to provide an educational and entertaining system. Information is accessible to users who are viewing multiple video pictures. The information relates and describes what is being viewed. Users who have different types of equipment, with different data rates, are able to access and use the system of the present invention. Users may interactively communicate with a video lecturer by asking questions and receiving answers.

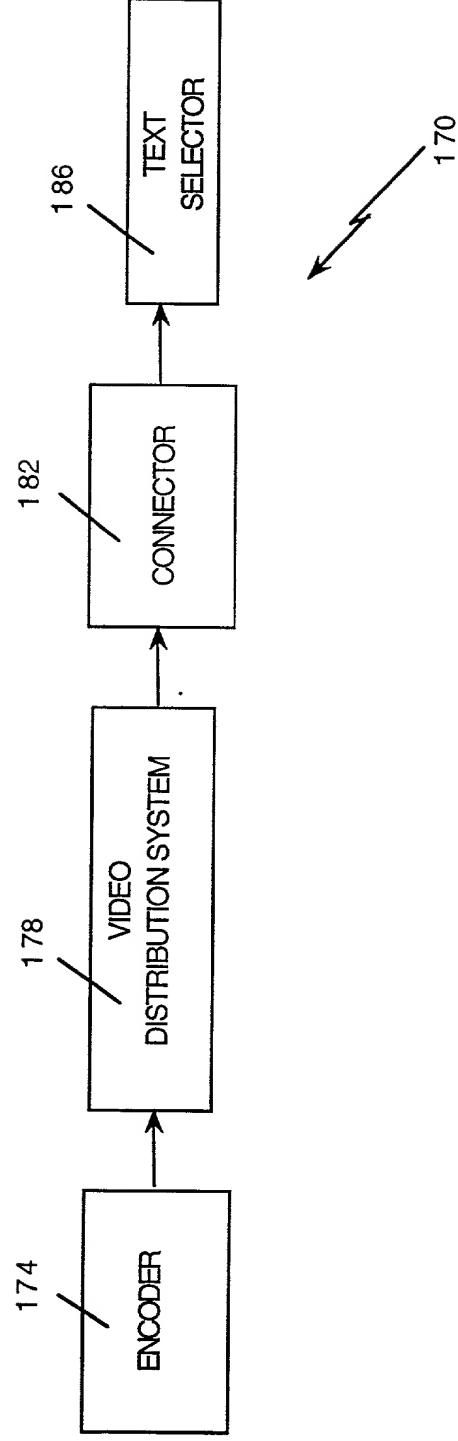


Fig. 1b

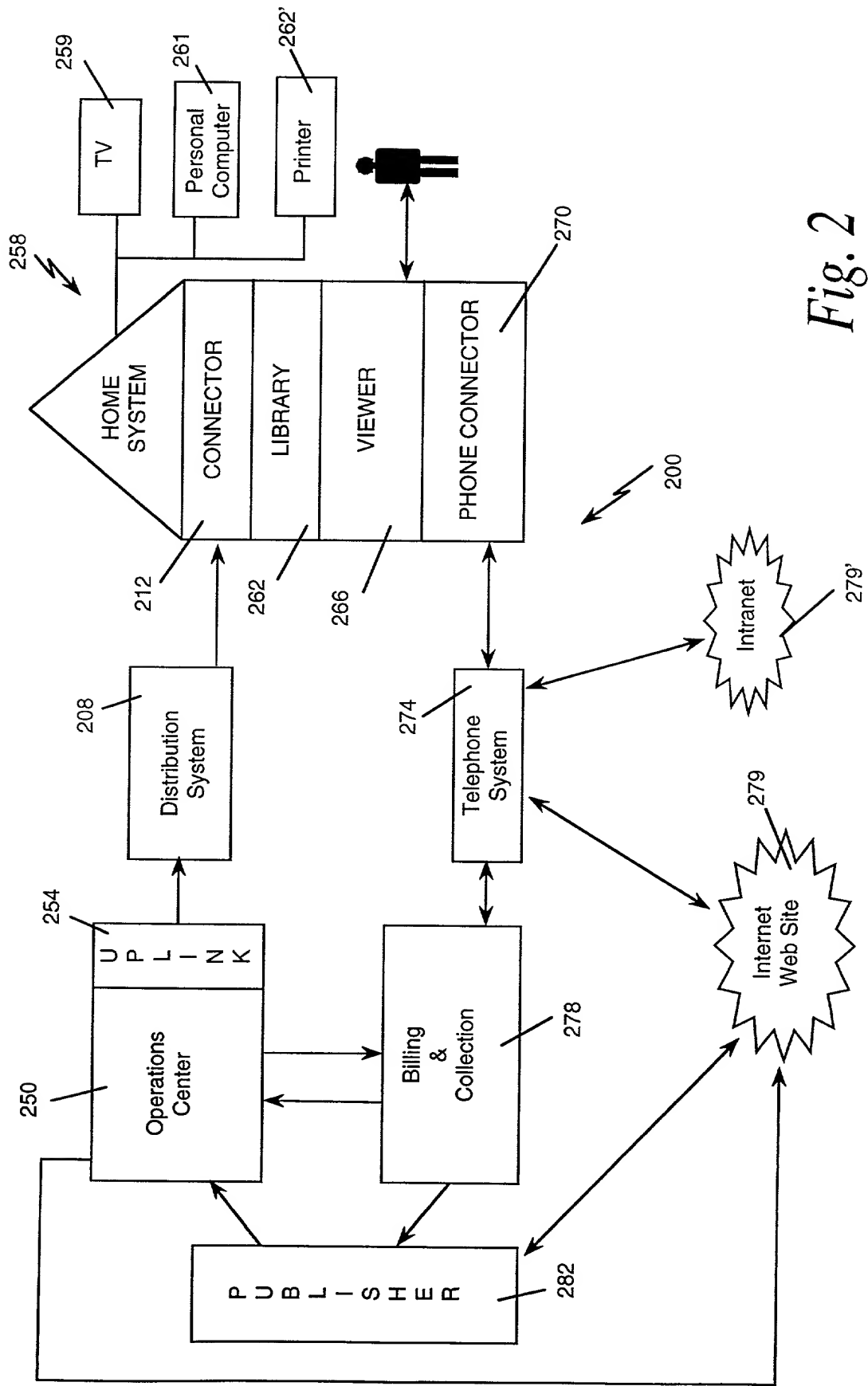


Fig. 2

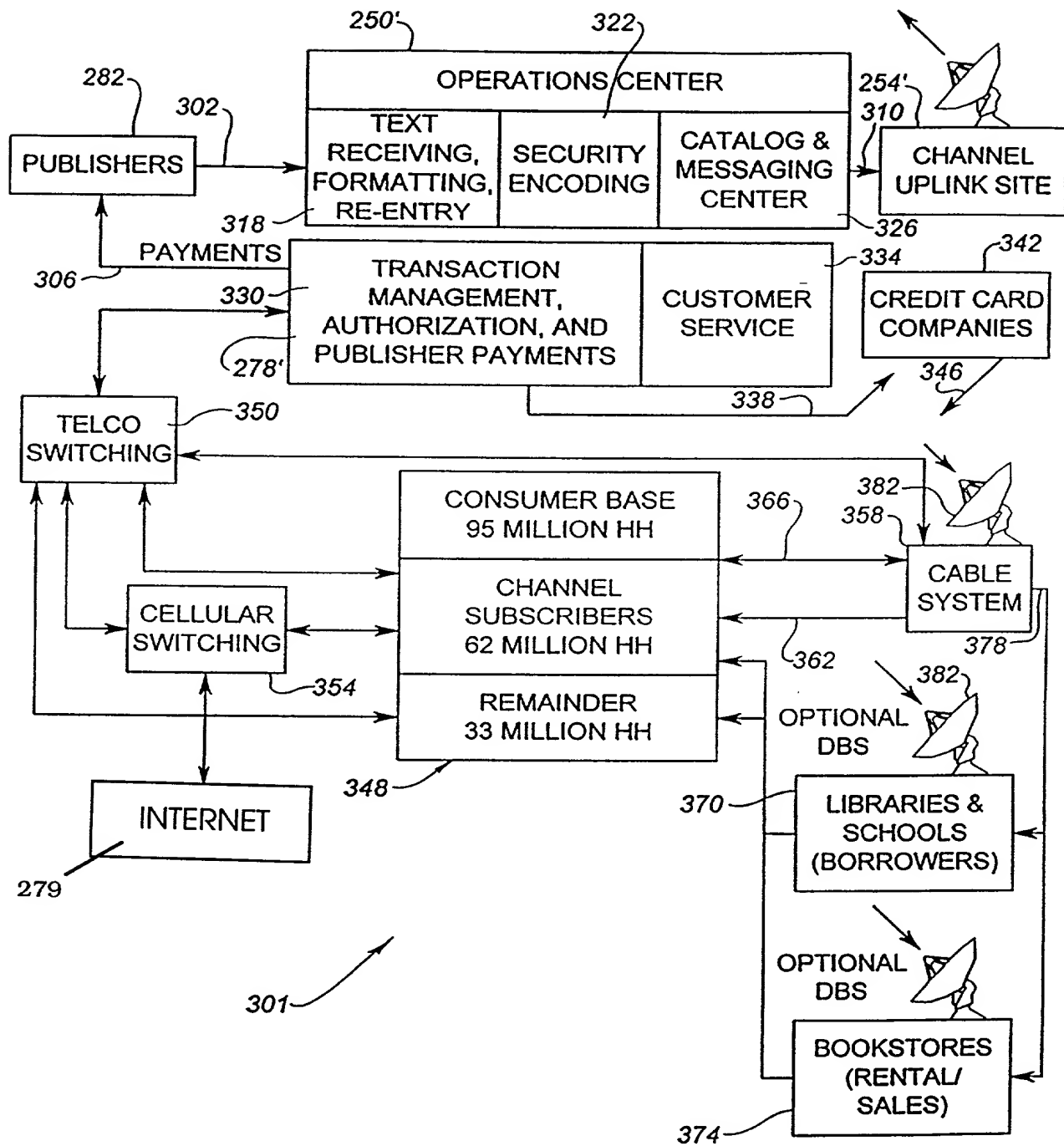


Fig. 3

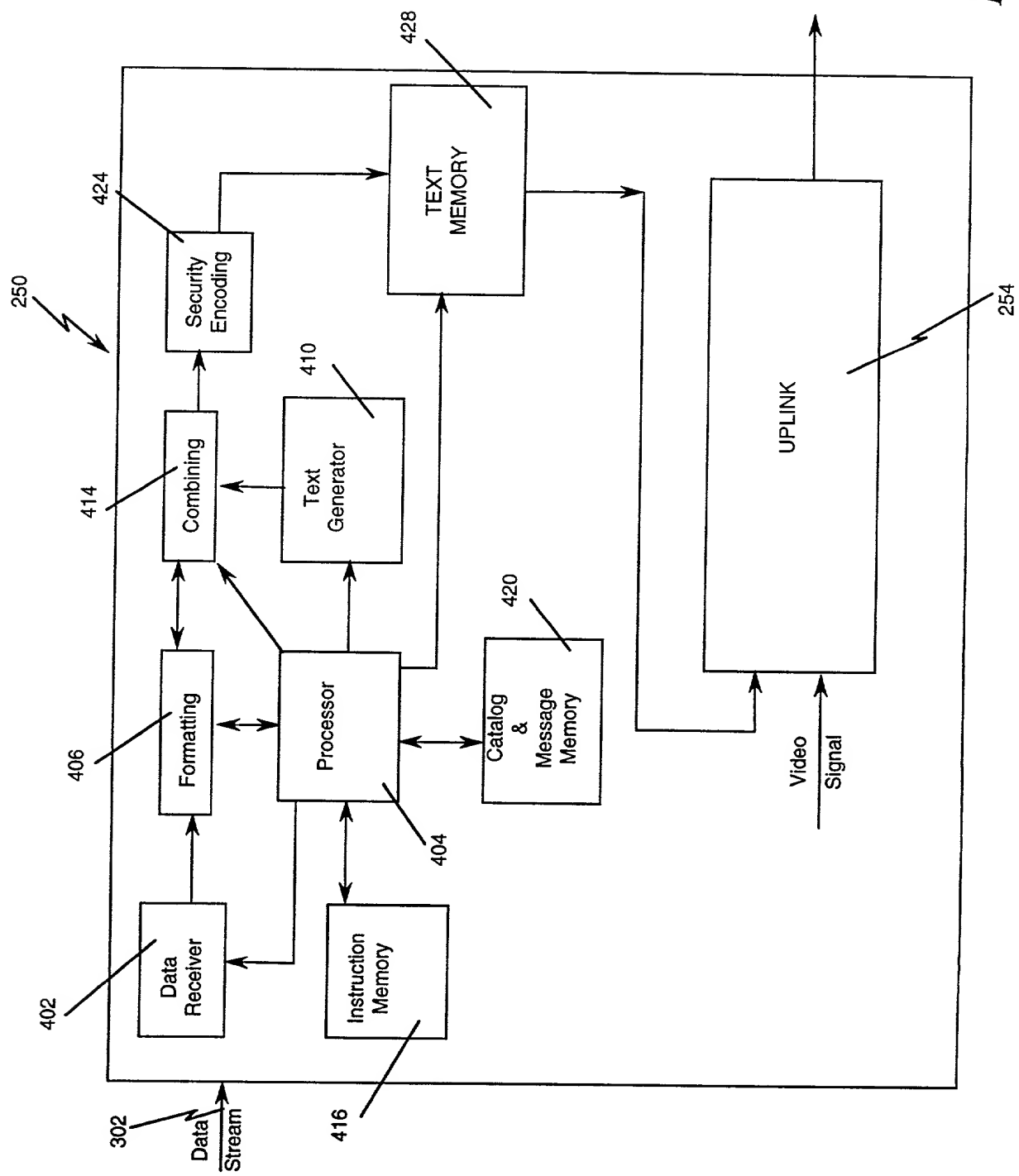


Fig. 4

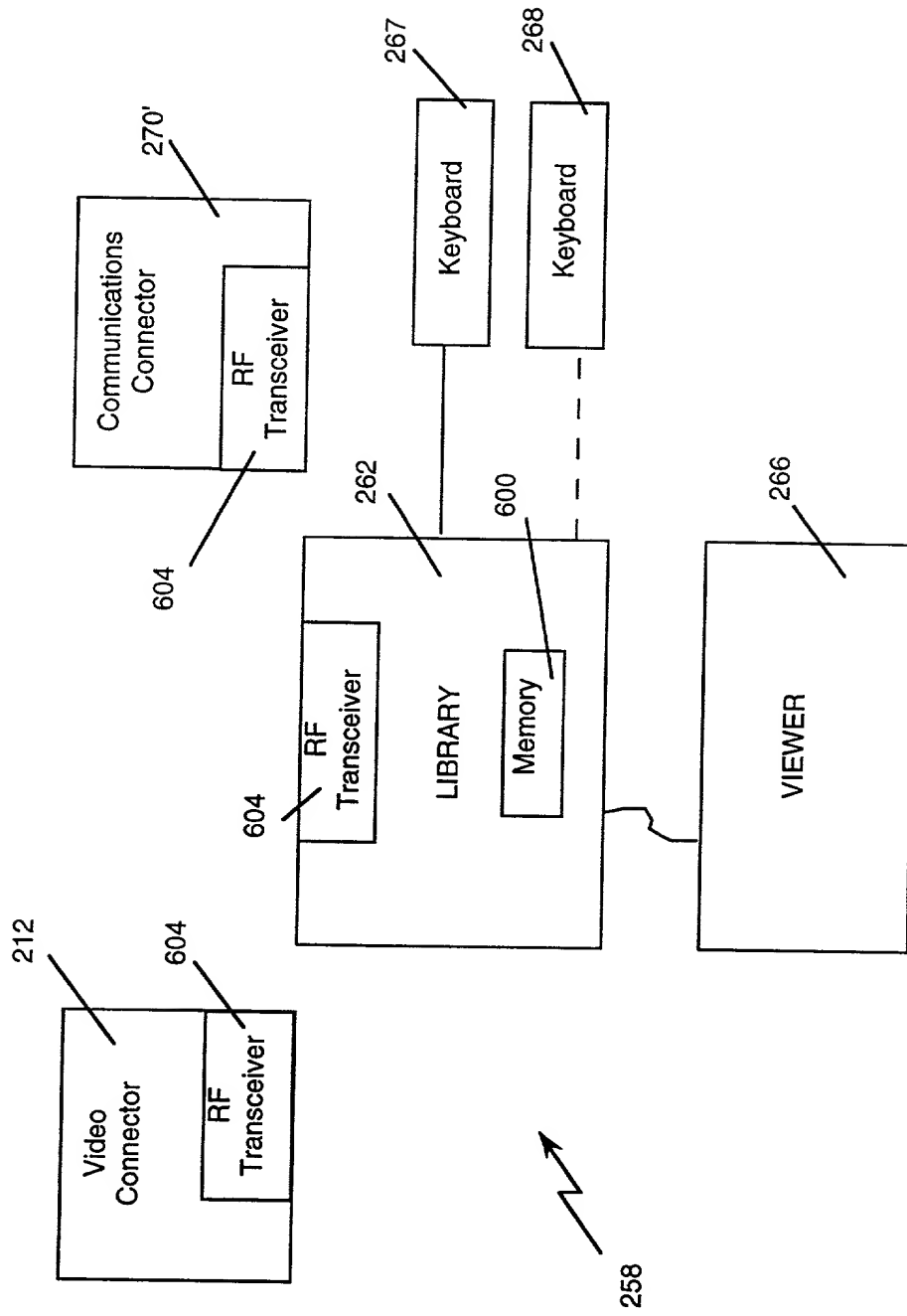


Fig. 6a

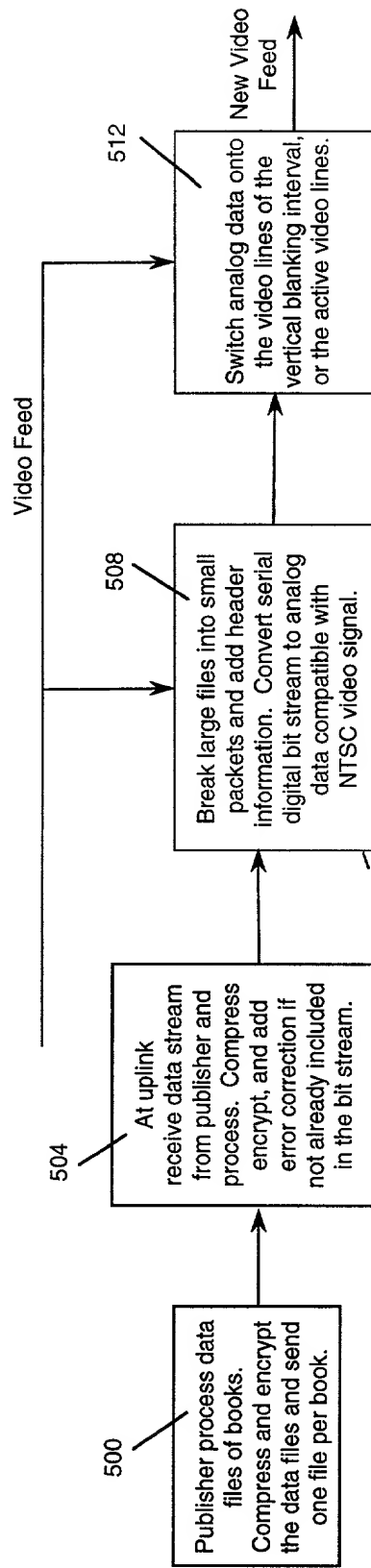


Fig. 5a

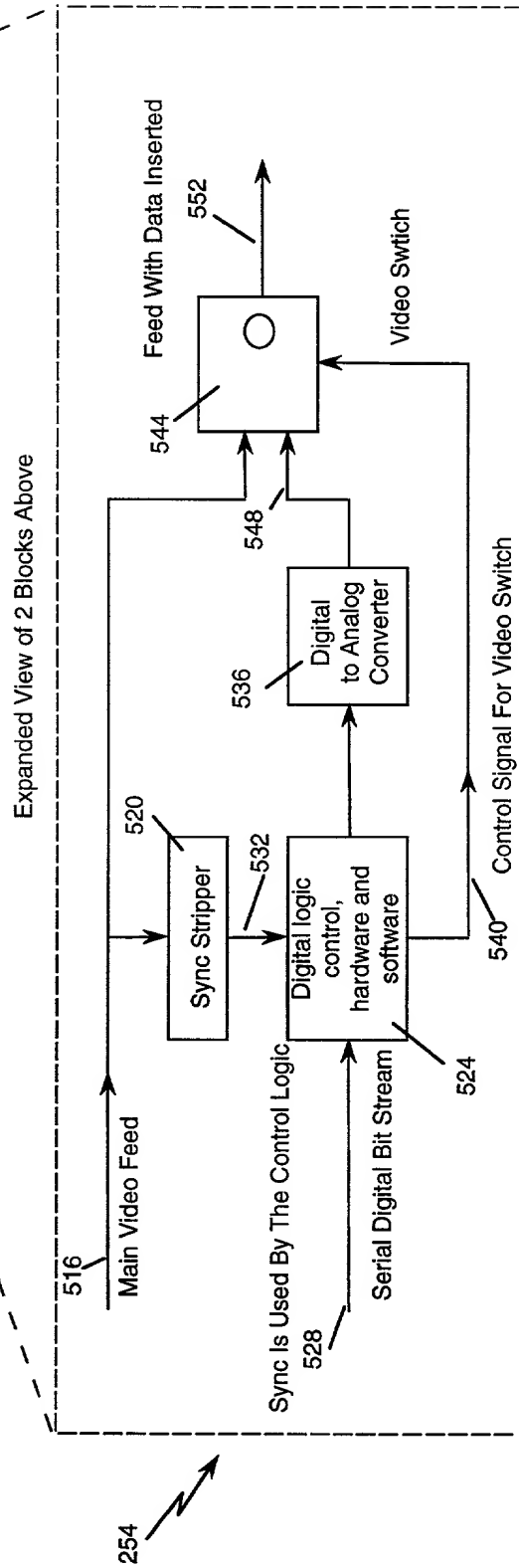


Fig. 5b

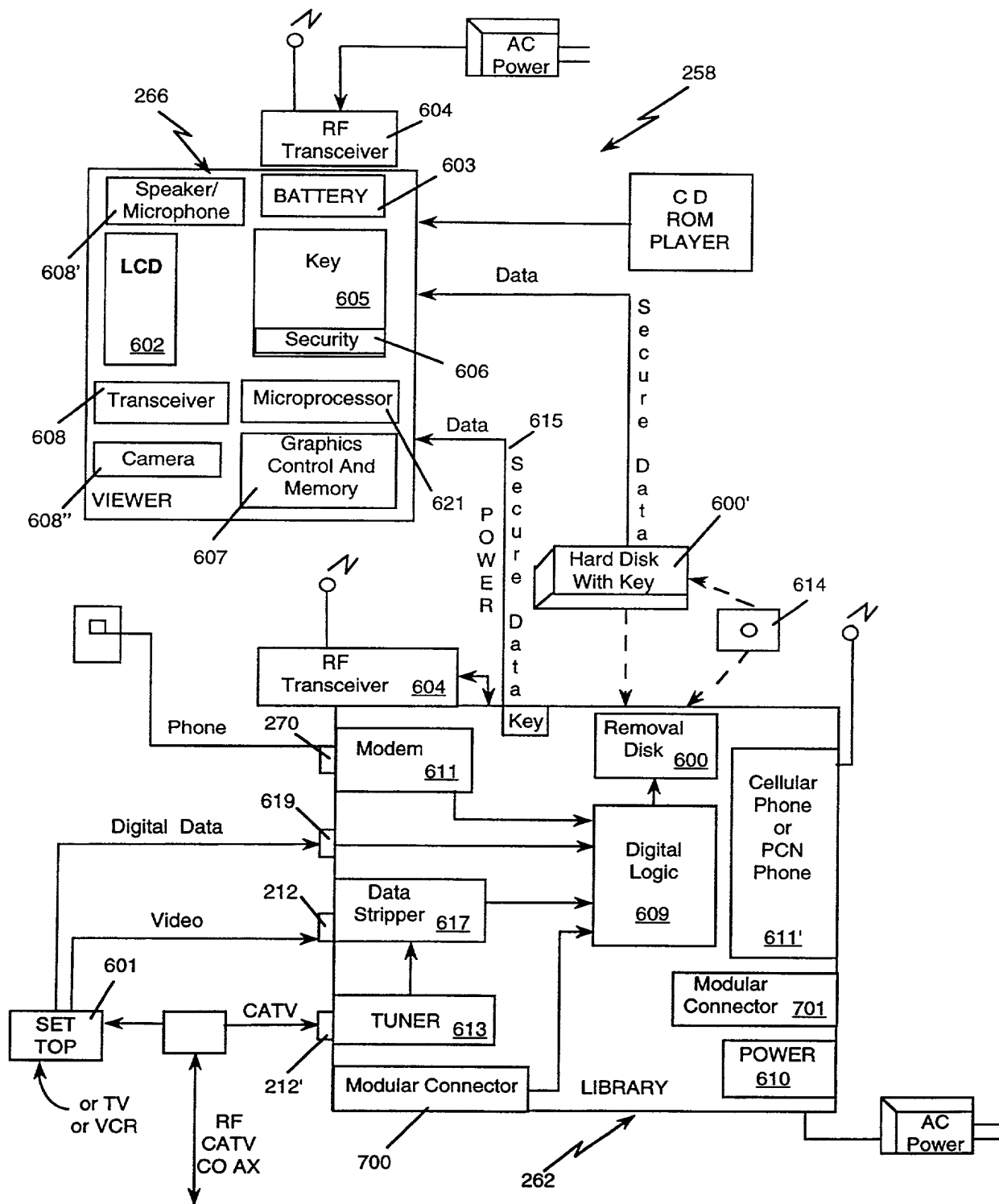


Fig. 6b

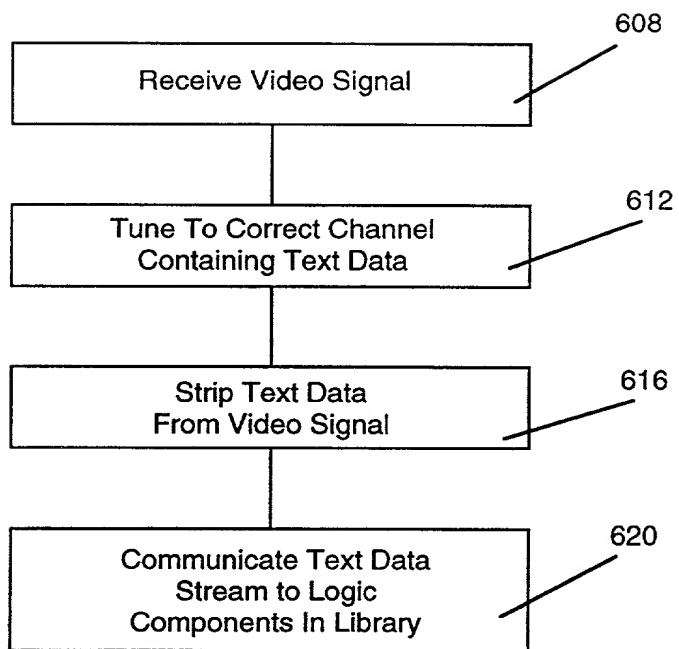


Fig. 7

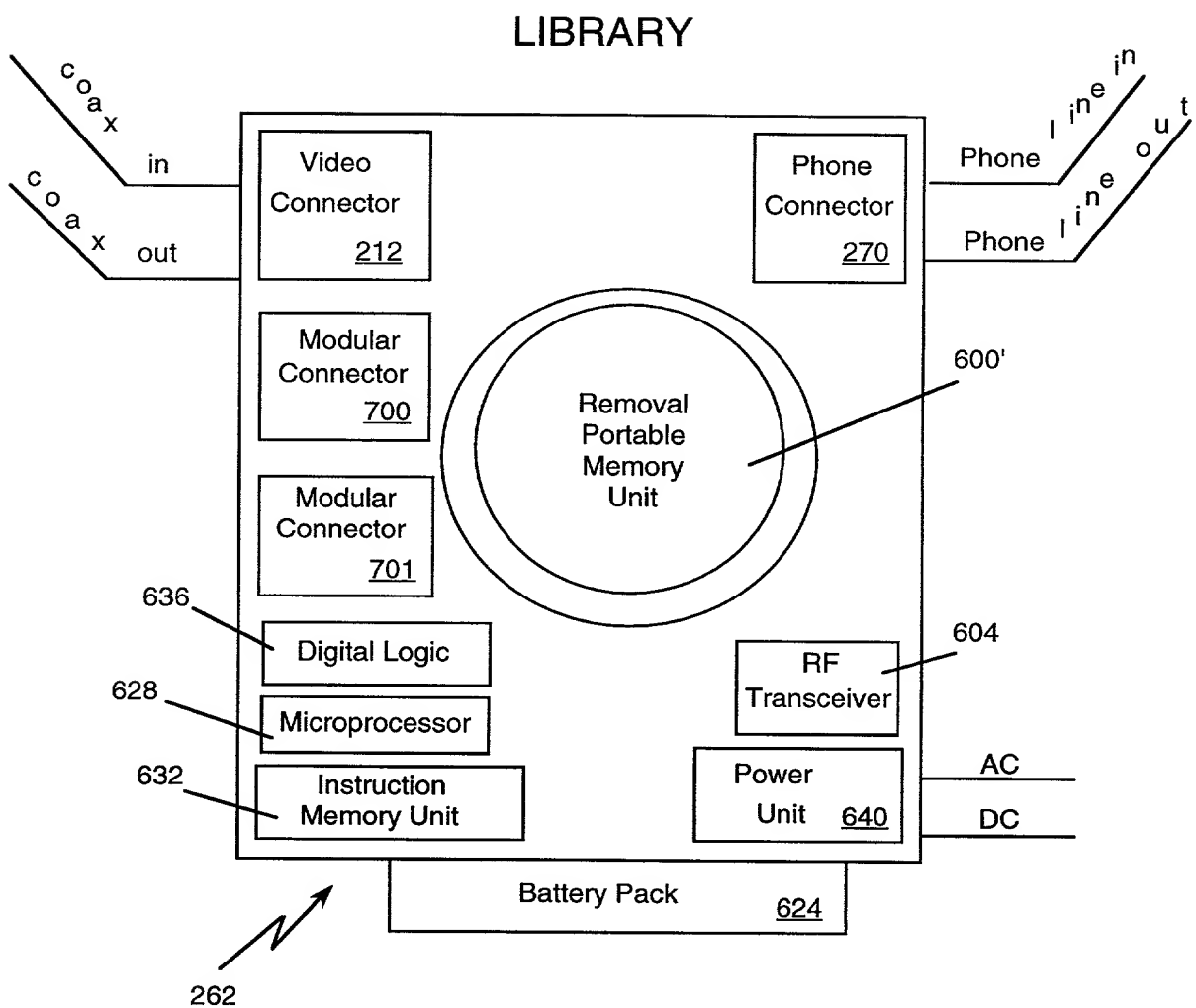


Fig. 8

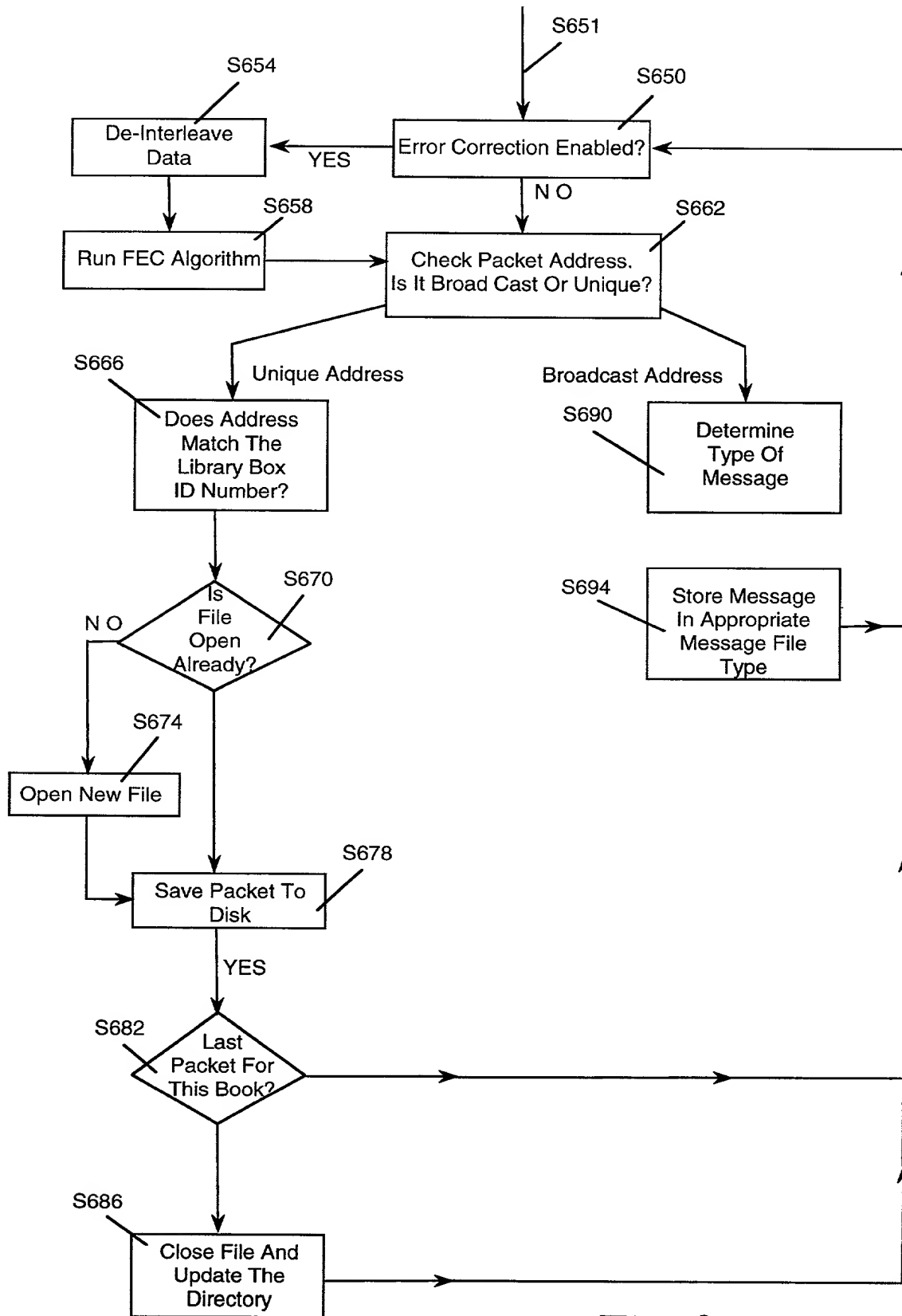


Fig. 9

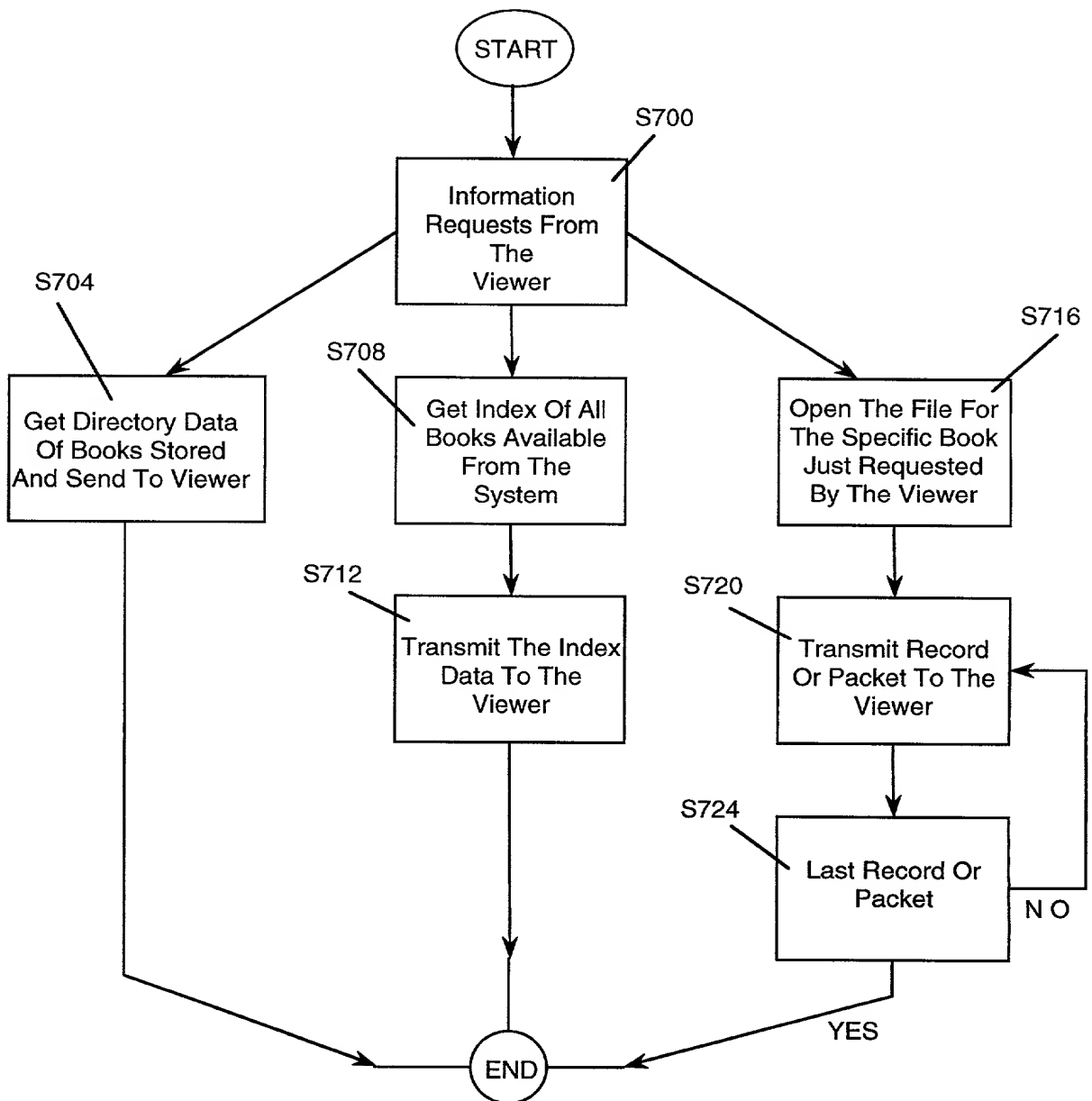


Fig. 10

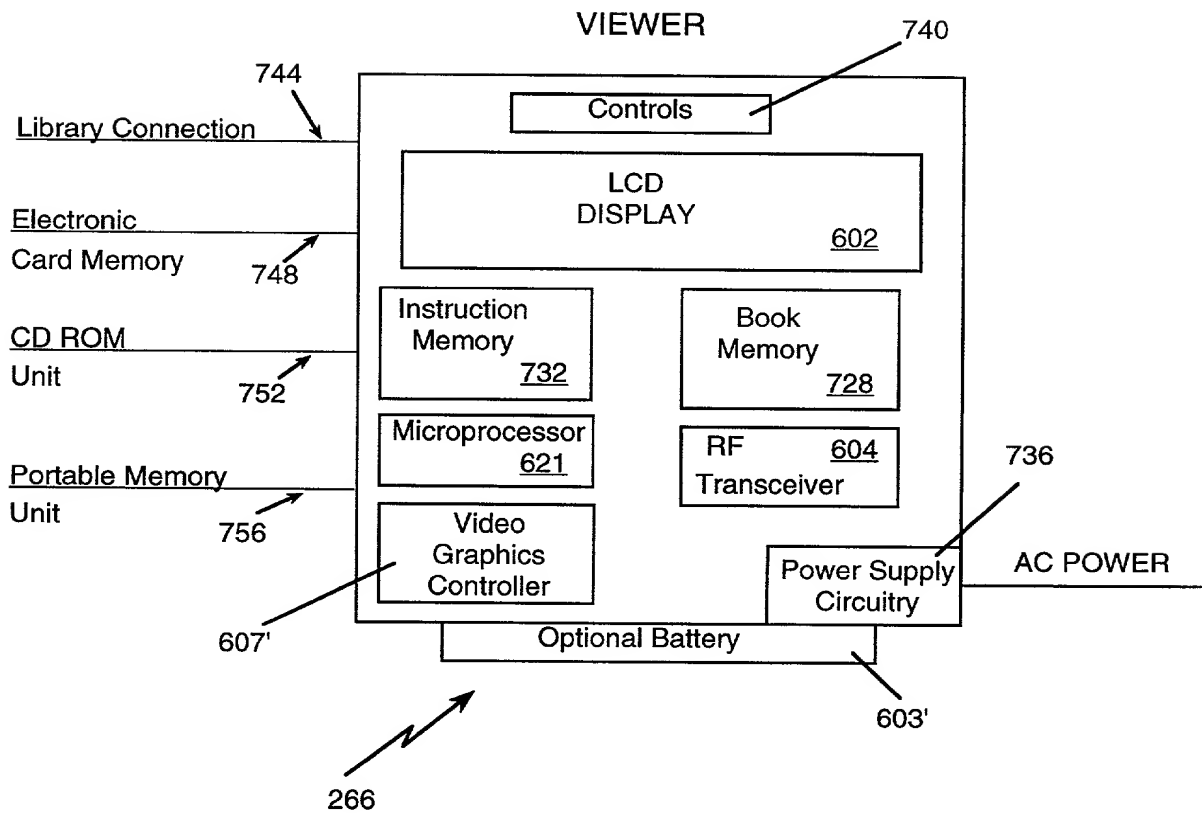


Fig. 11

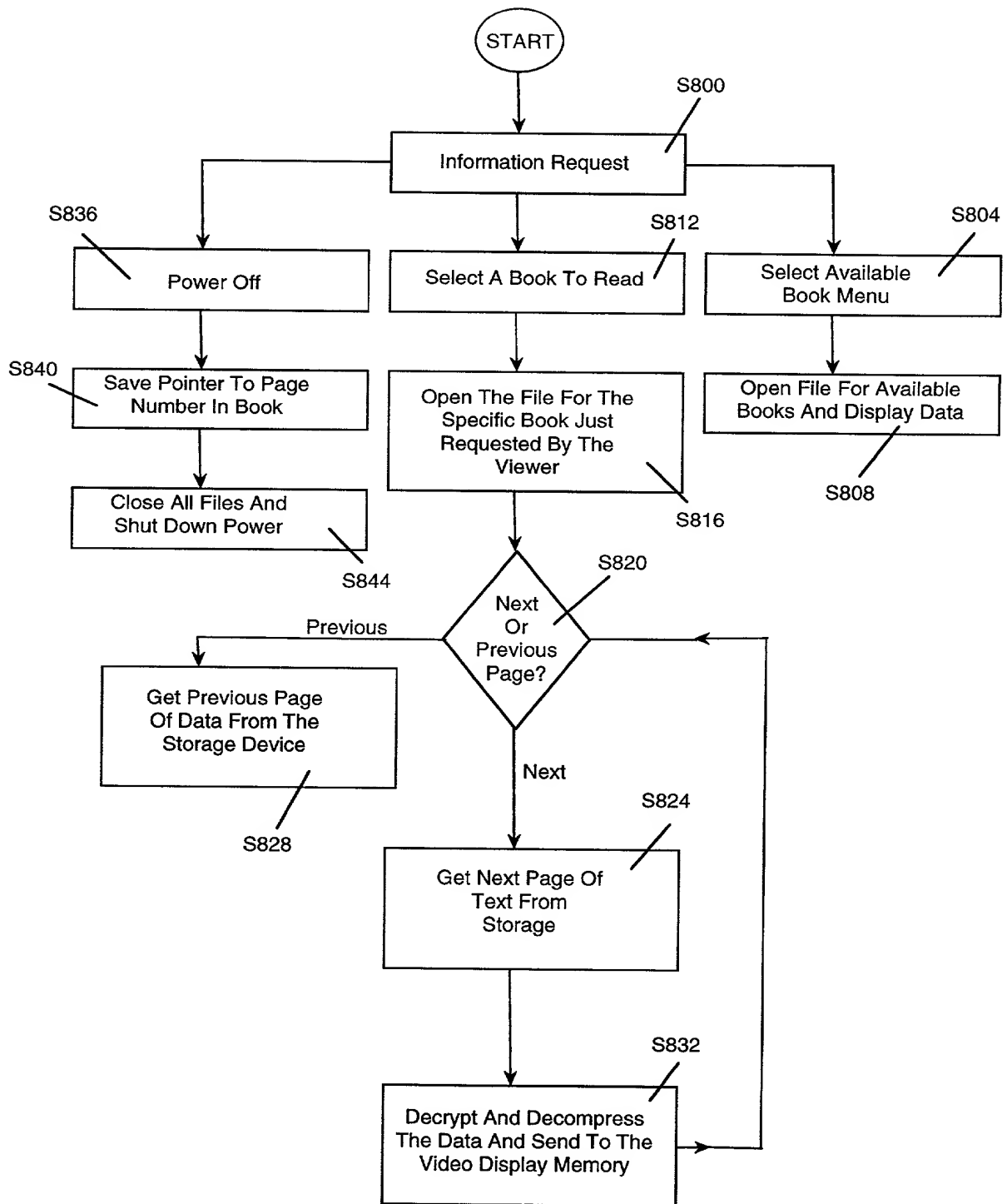


Fig. 12

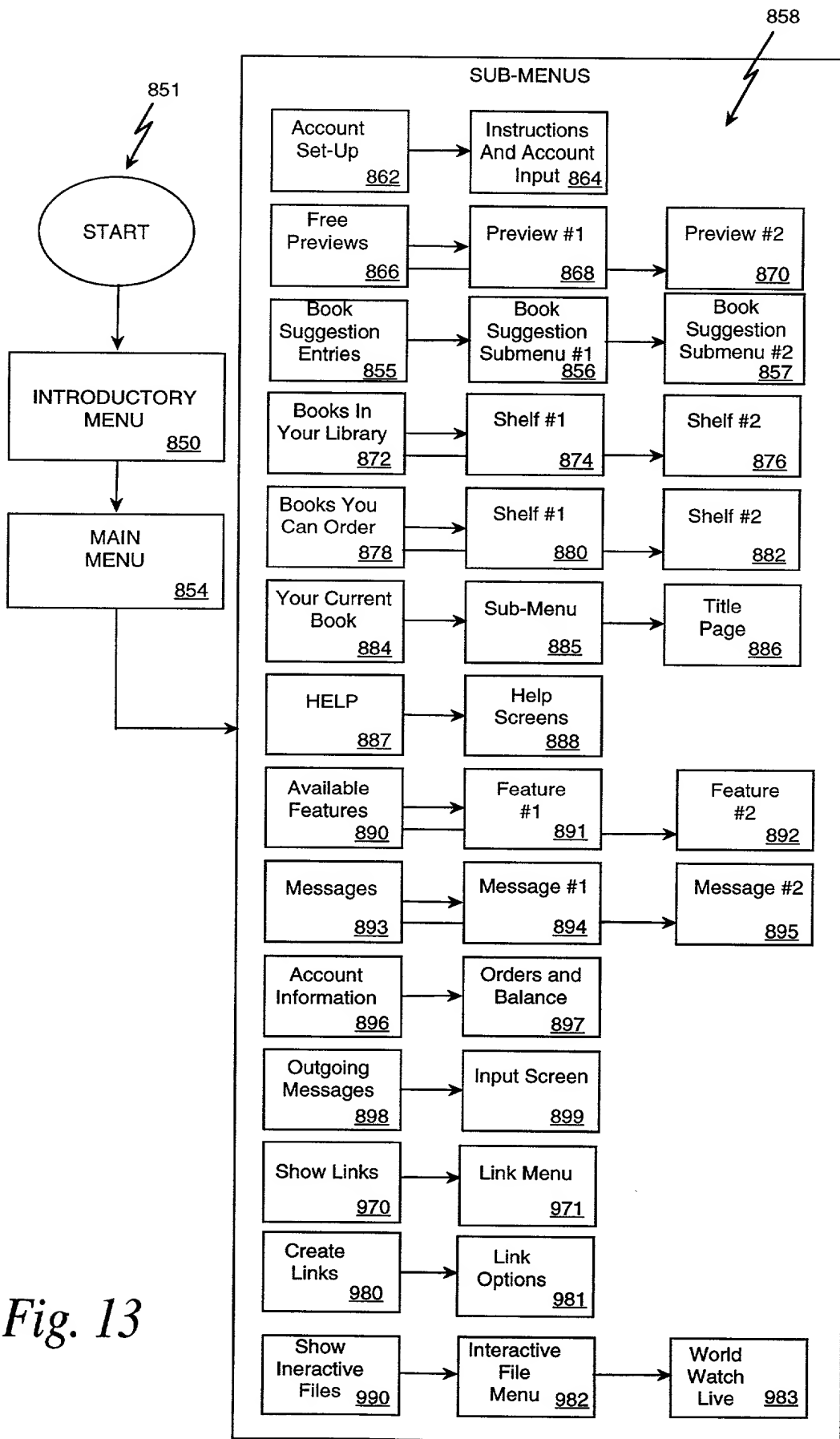


Fig. 13

Fig. 14a

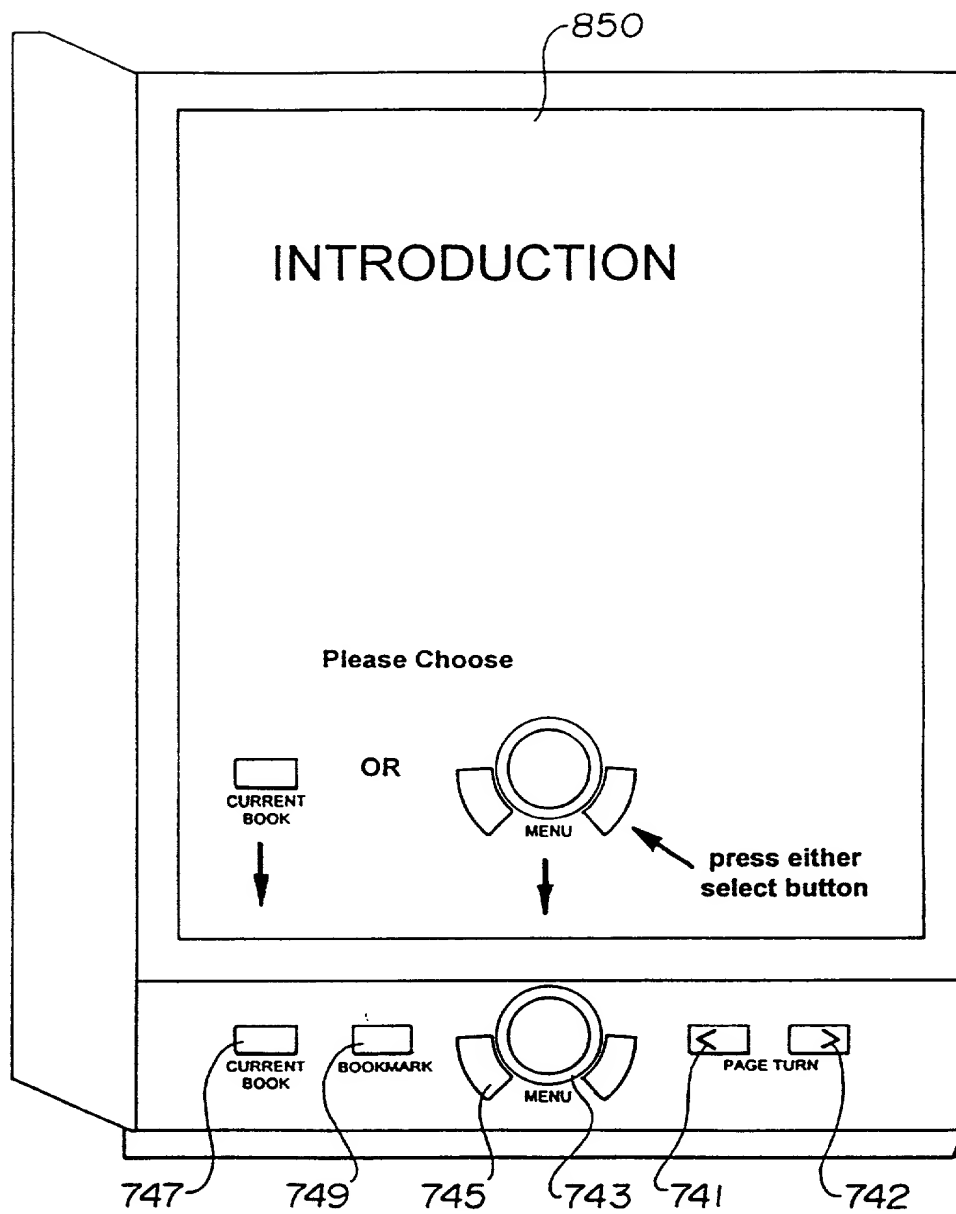


Fig. 14b

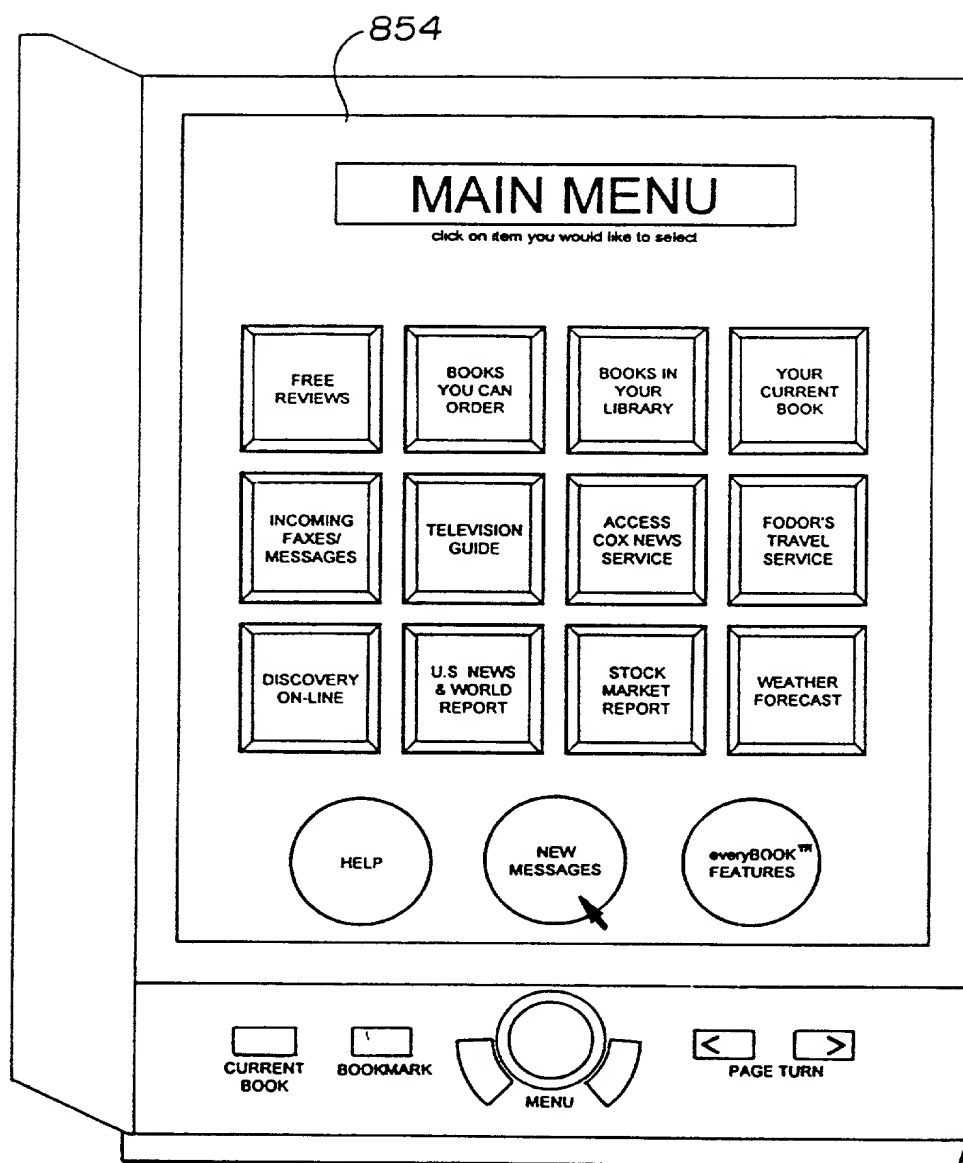


Fig. 14c

872

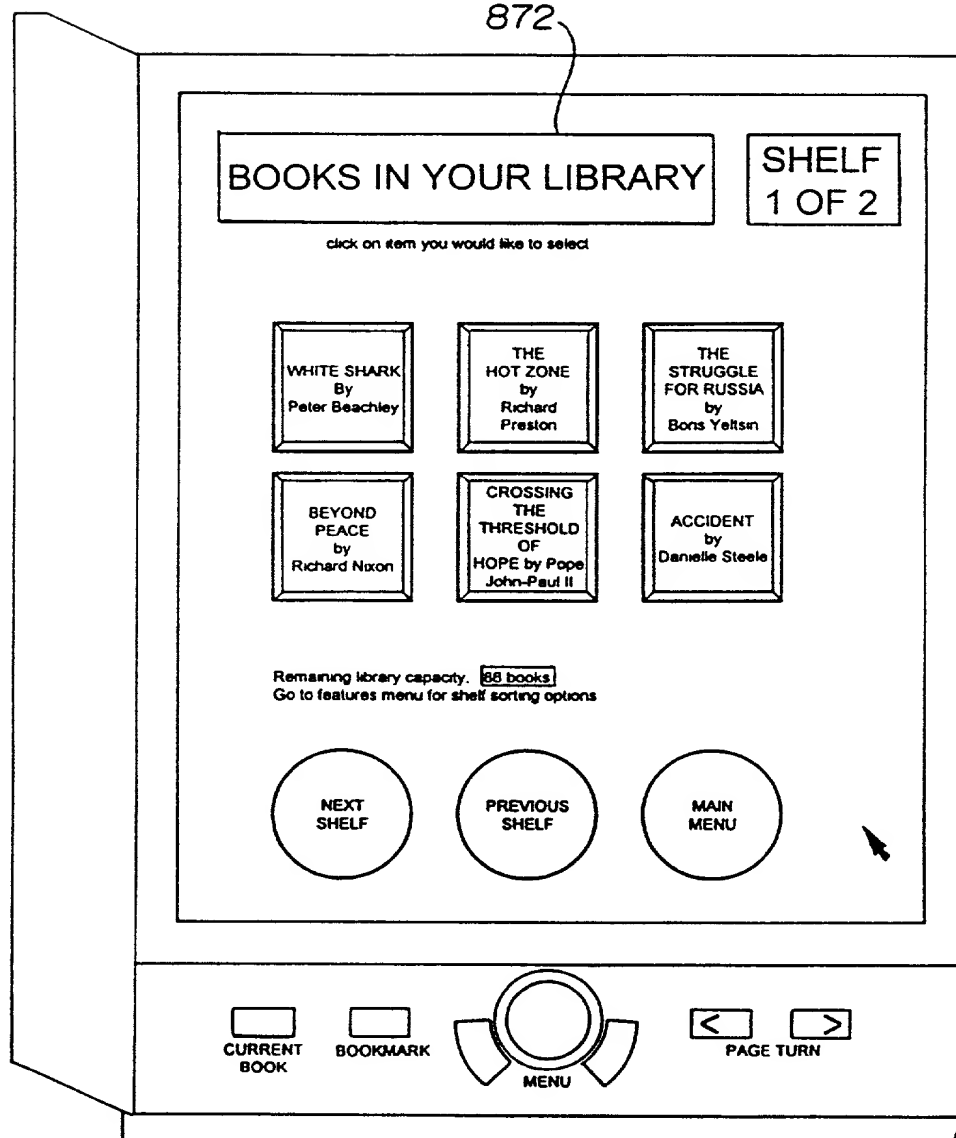


Fig. 14d

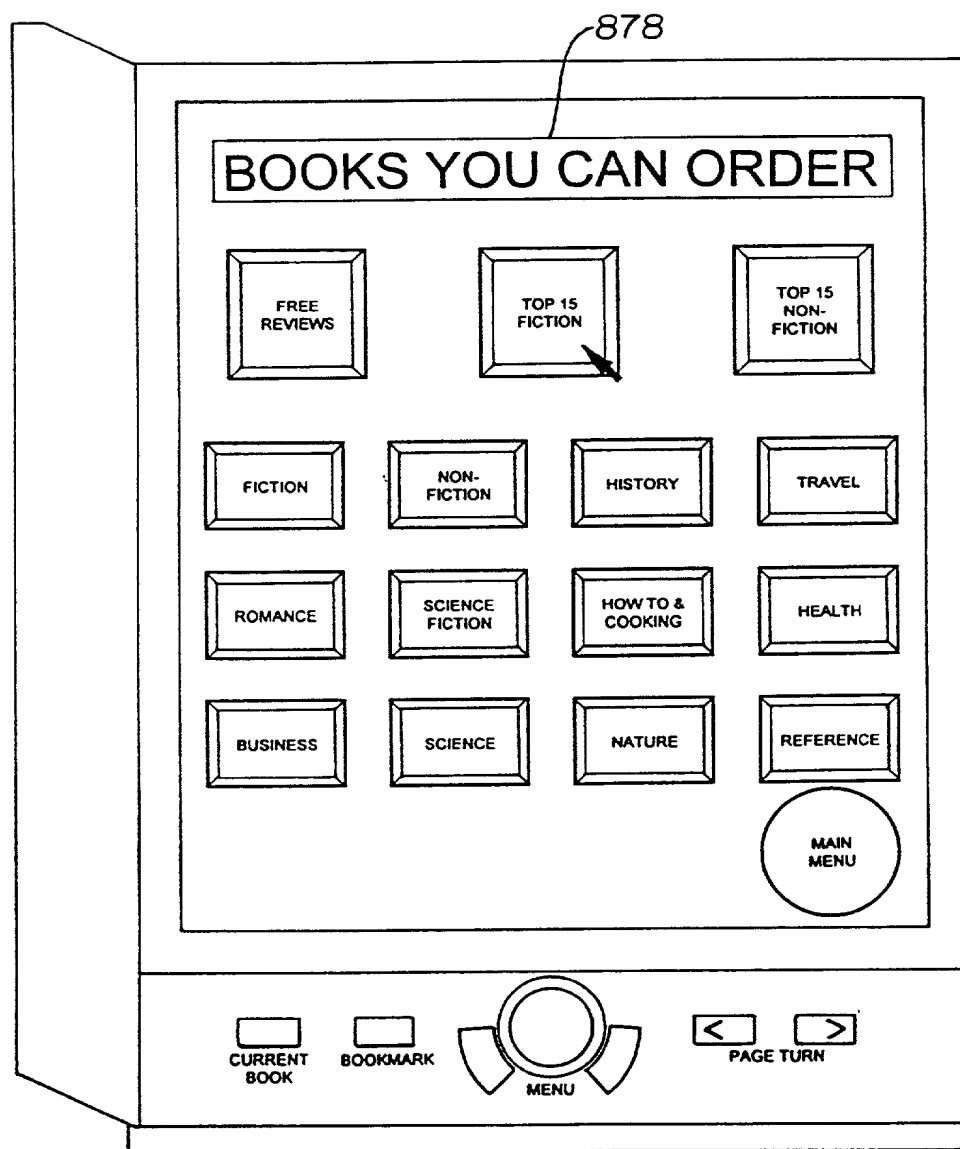


Fig. 14e

880

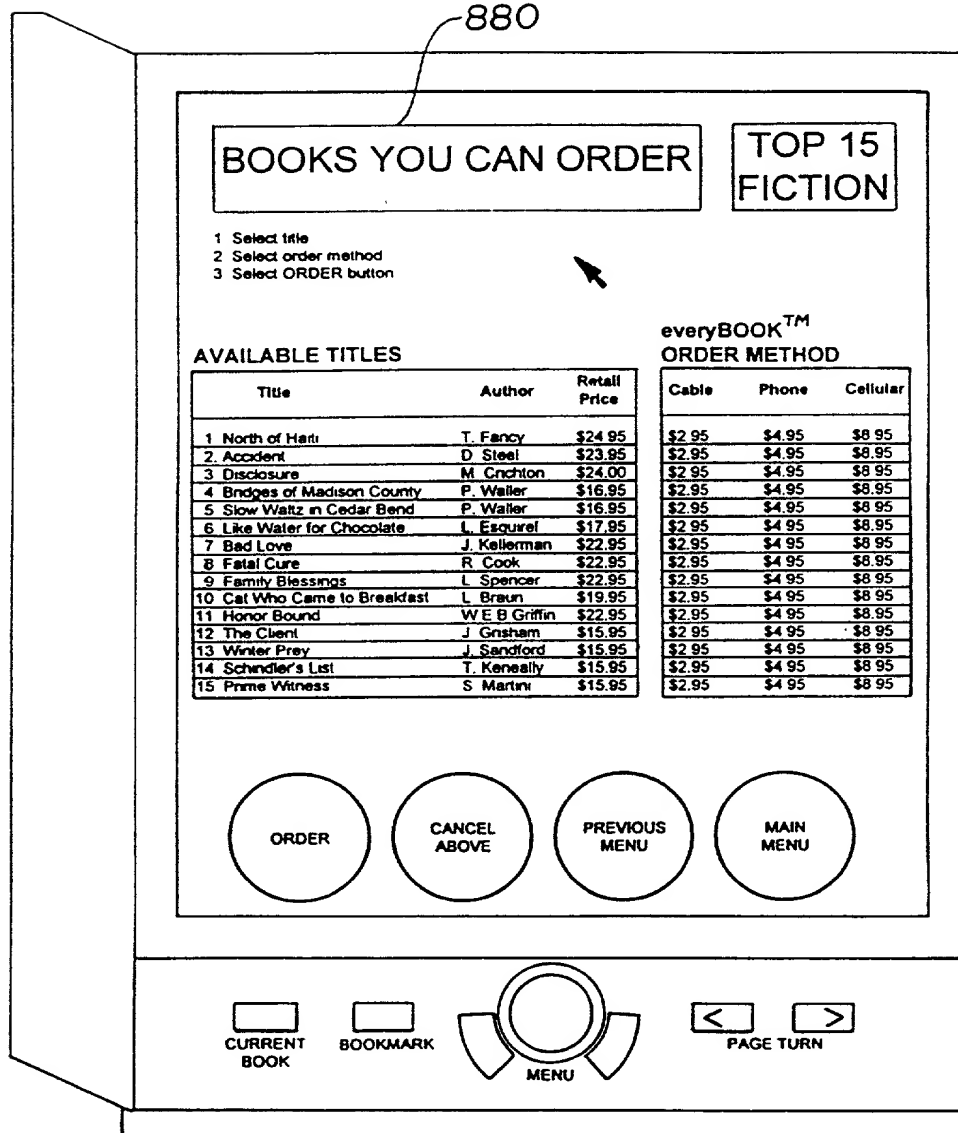


Fig. 14f

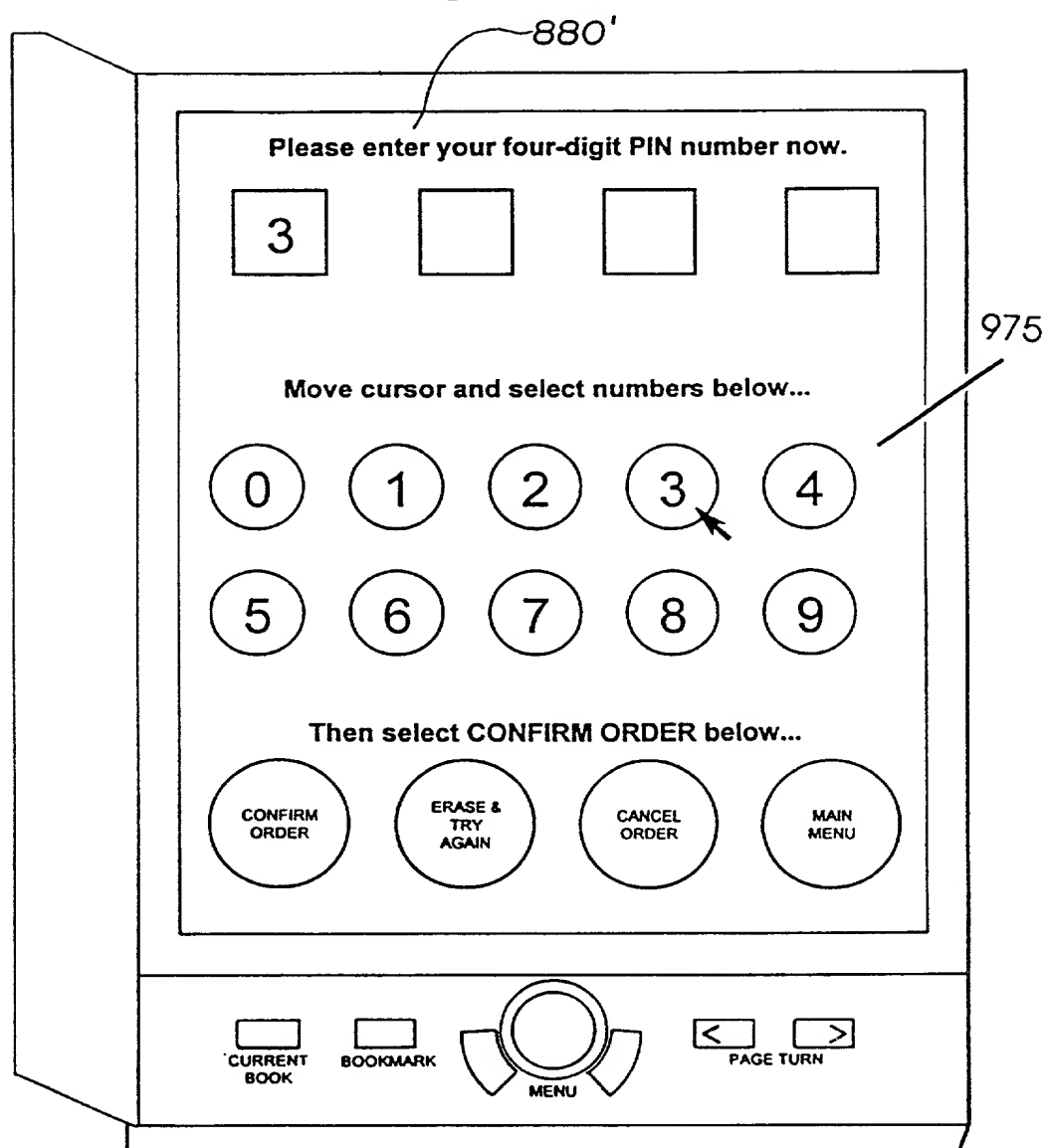


Fig. 14g

862

SET UP ACCOUNT **SCREEN 1 OF 6**

Step 1 Enter a four-digit PIN number to protect your credit card information.

3

Move cursor and select numbers below...

0	1	2	3	4
5	6	7	8	9

Write down your PIN code and keep it in a secure place.

CANCEL ORDER **MAIN MENU**

CURRENT BOOK **BOOKMARK** **MENU** **PAGE TURN**

Fig. 14h

864

SET UP ACCOUNT

SCREEN
2 OF 6

Step 2

Select a credit card you wish to use for
your everyBOOK™ purchase.

VISA

American
Express

Discover

Step 3

Enter your credit card number and
expiration date using keypad below.

exp. MM YY

Step 4

Enter your home phone number
using the keypad below.

area code

0

1

2

3

4

ERASE
& TRY
AGAIN

CONFIRM &
CONTINUE

5

6

7

8

9

CURRENT
BOOK

BOOKMARK

MENU

PAGE TURN

Fig. 14i

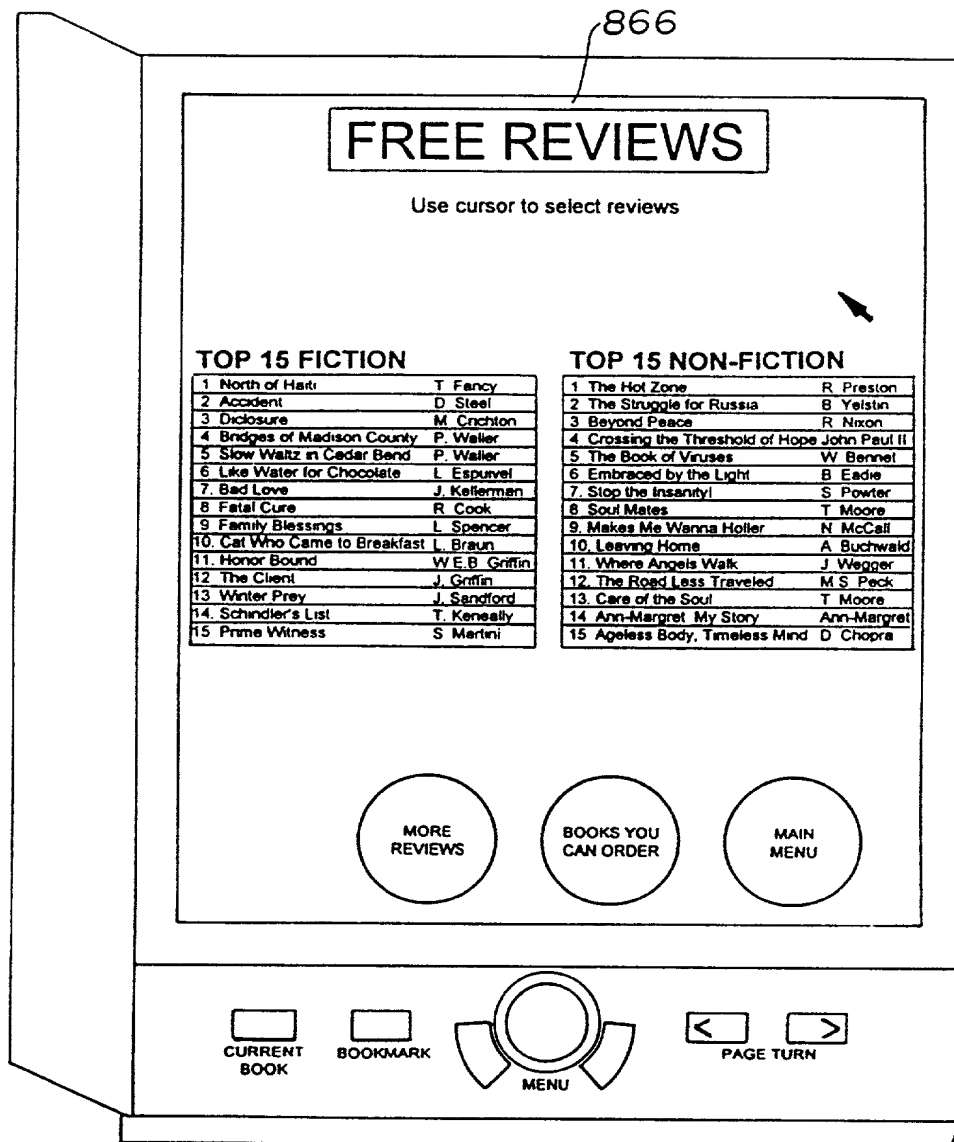


Fig. 14j

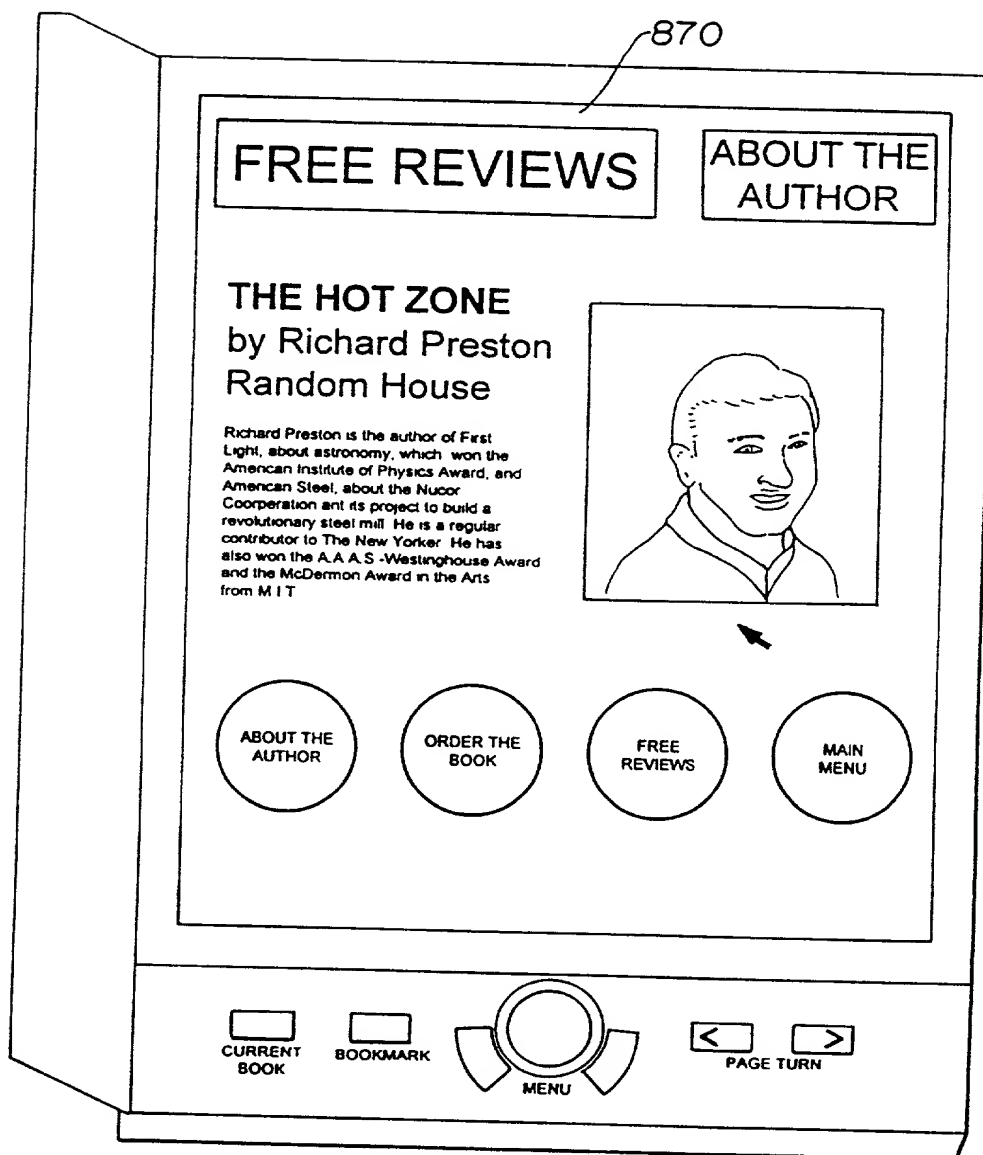


Fig. 15

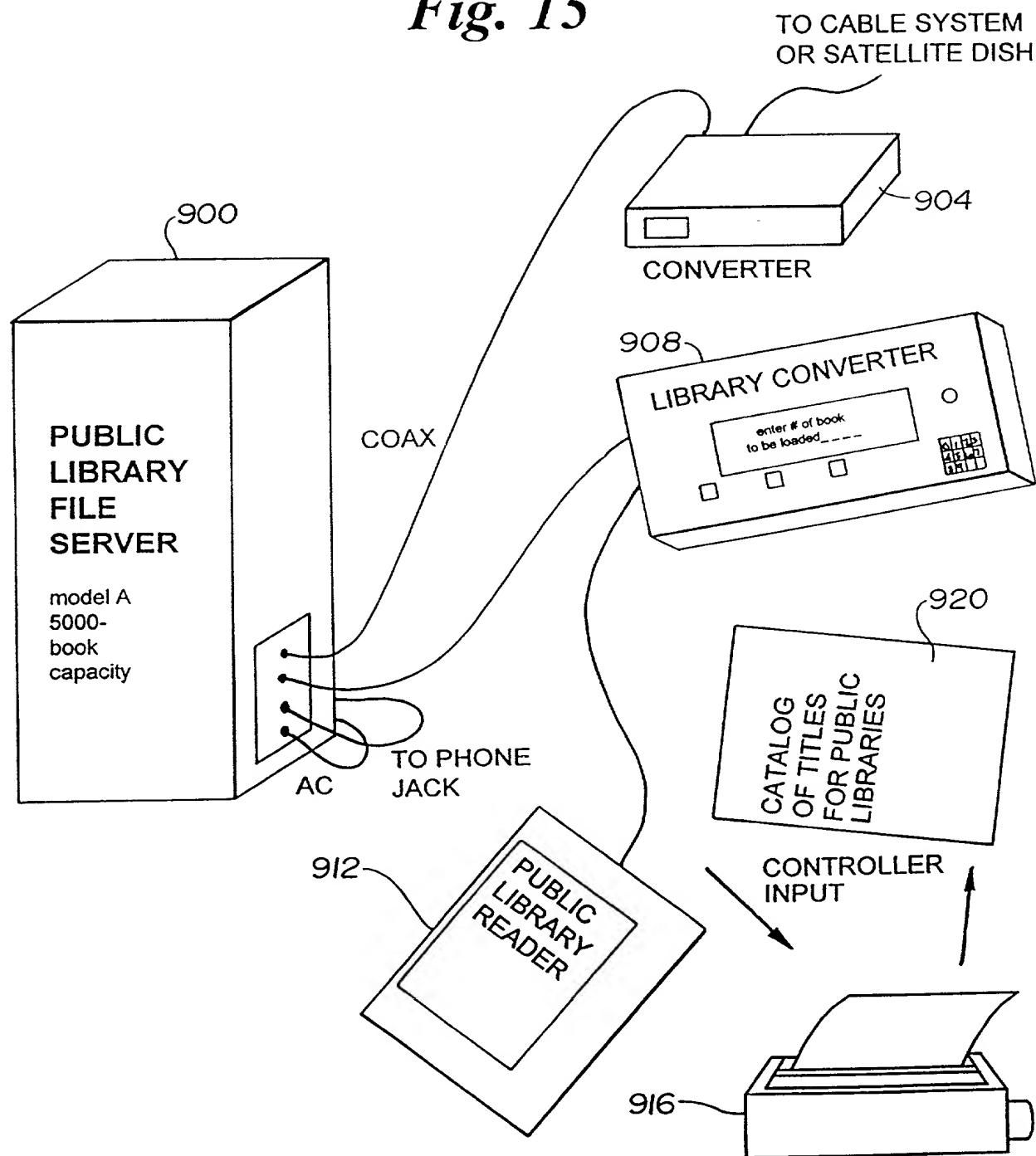


FIG. 16a

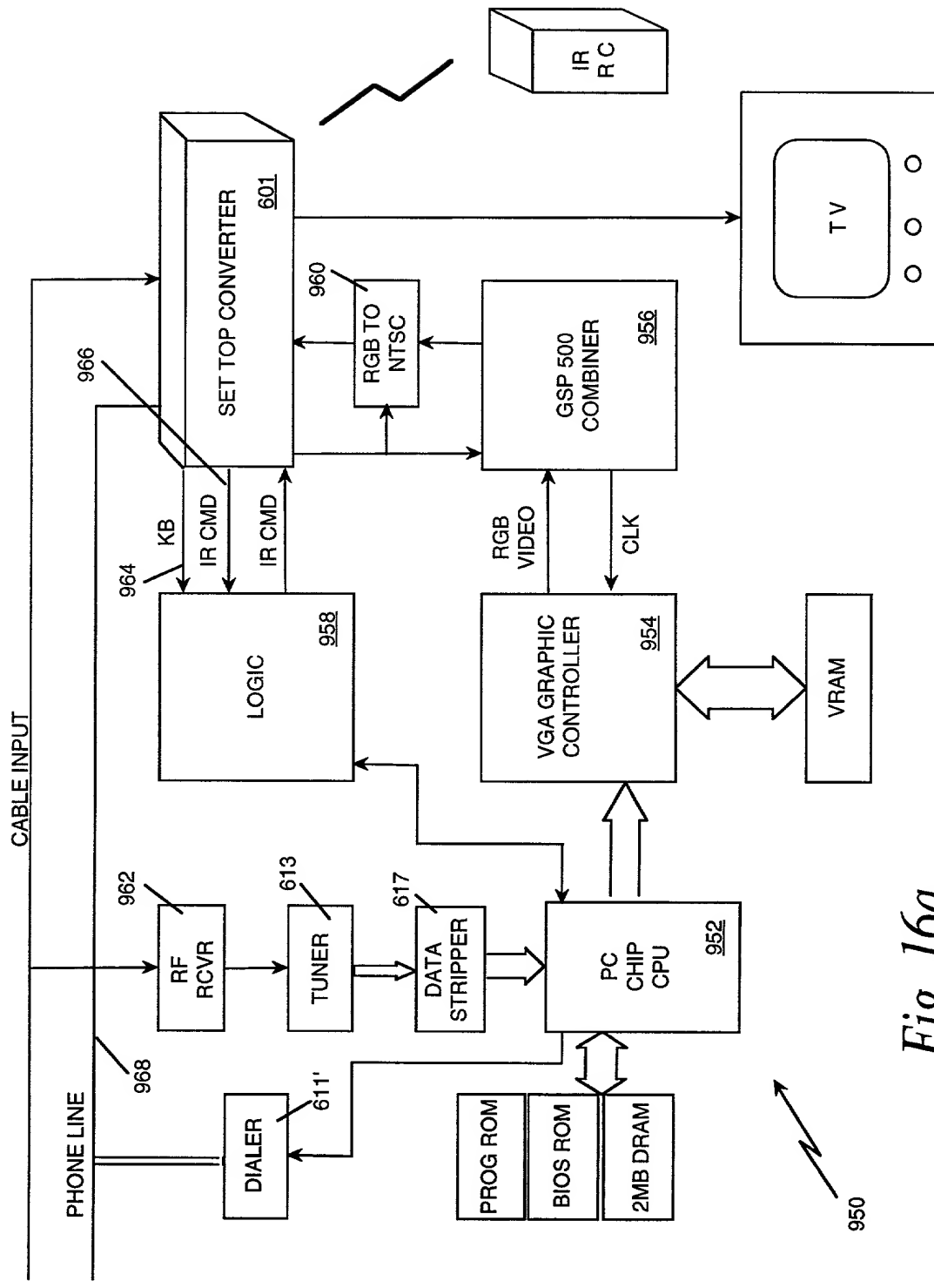


Fig. 16a

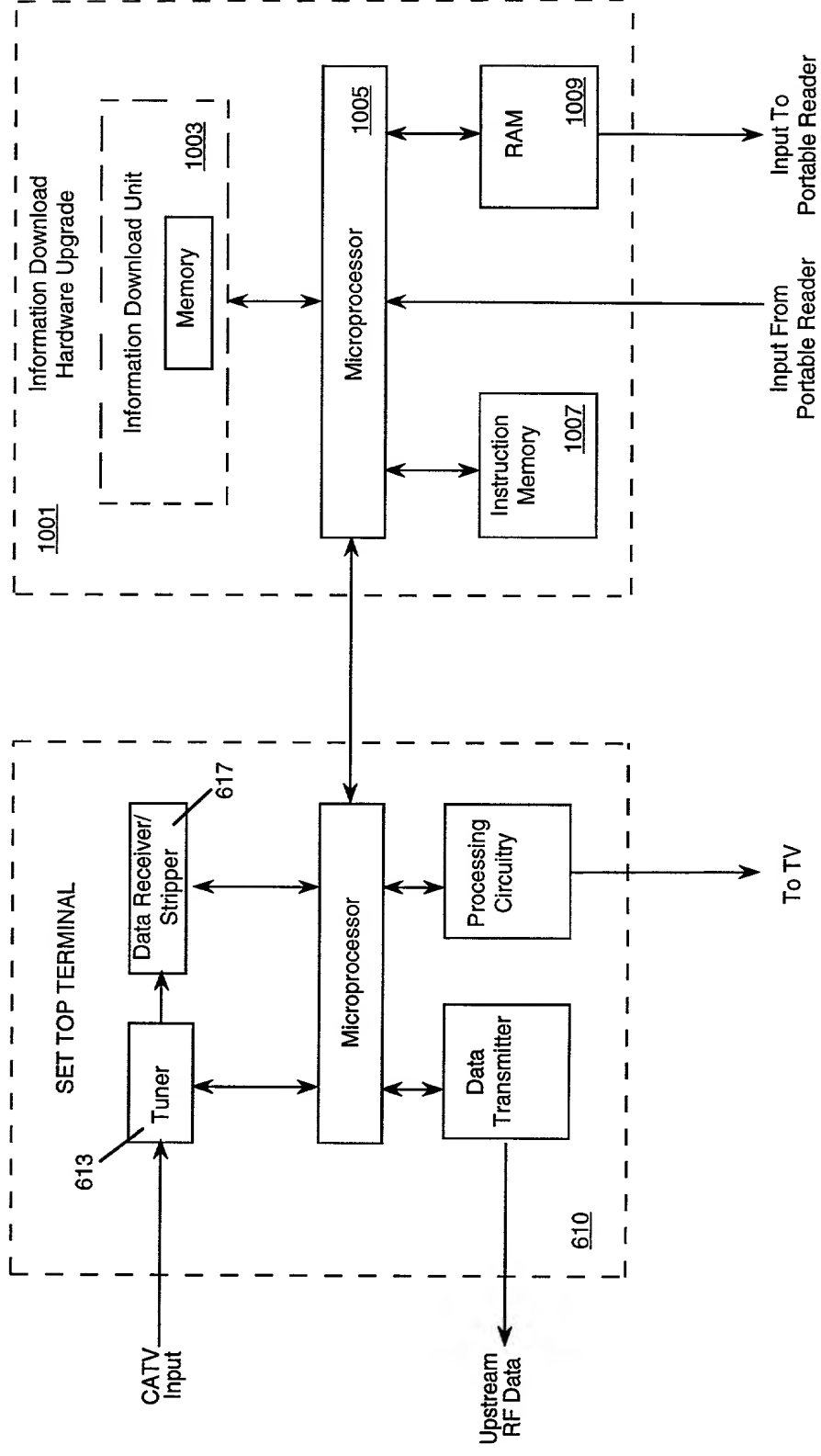


Fig. 16b

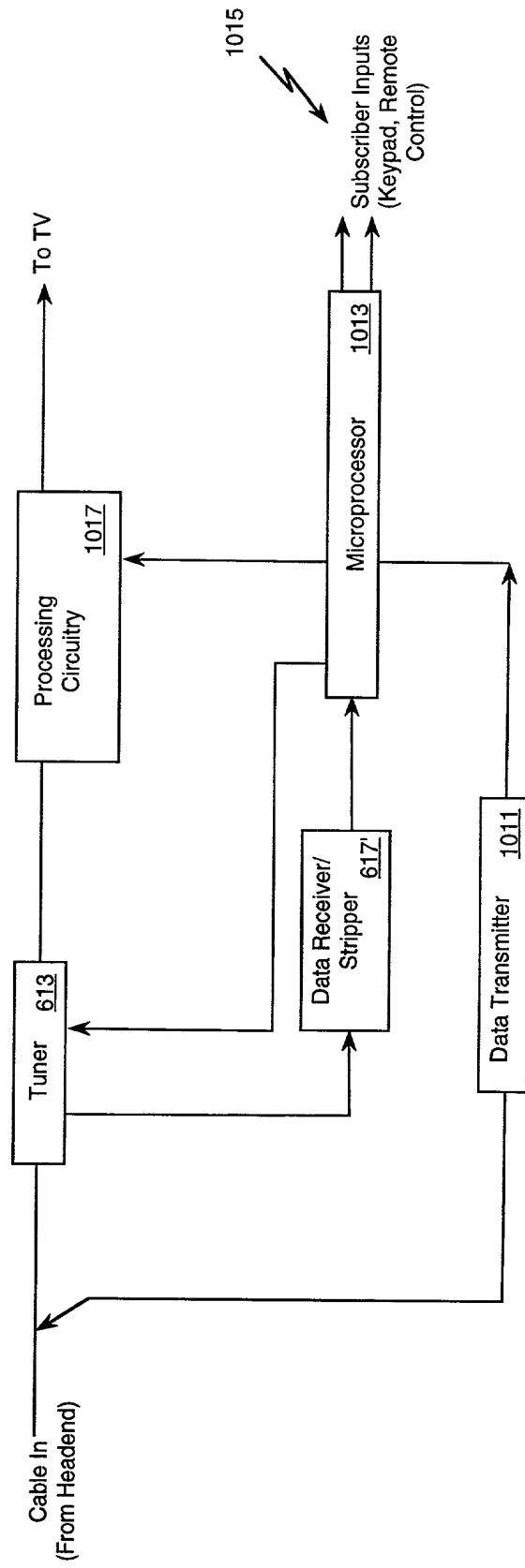
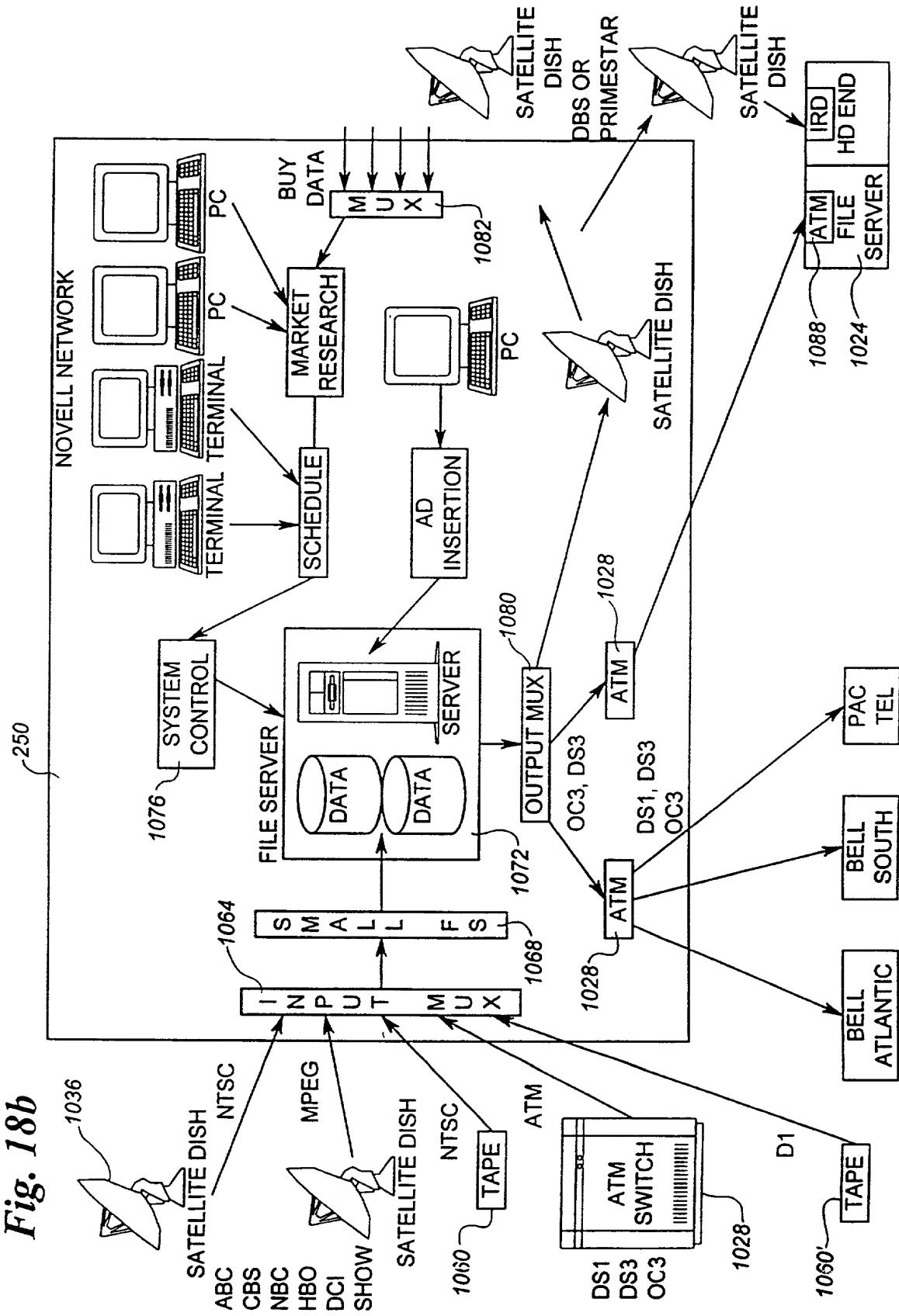


Fig. 17

Fig. 18b



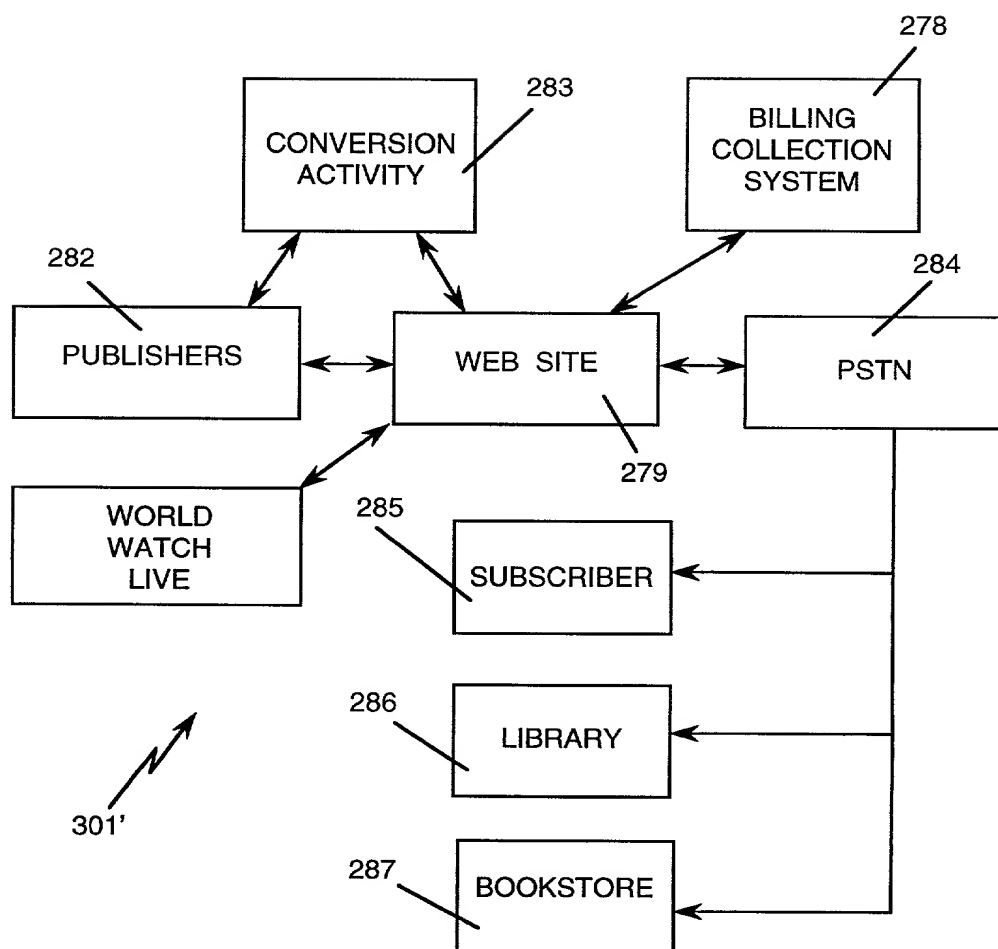


Fig. 19

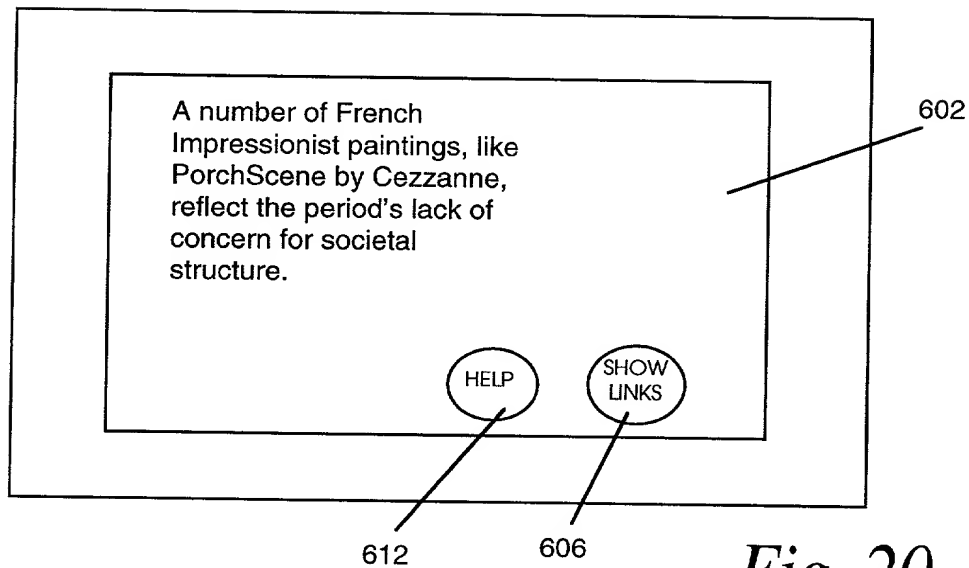


Fig. 20

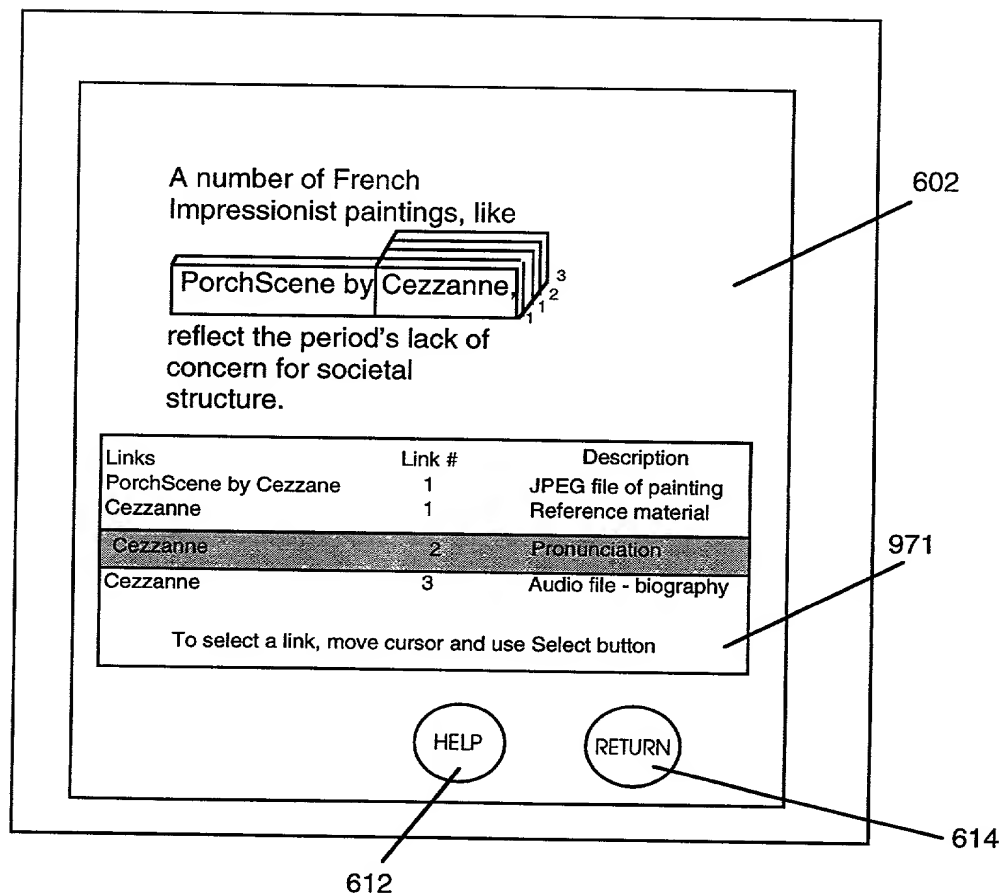


Fig. 21

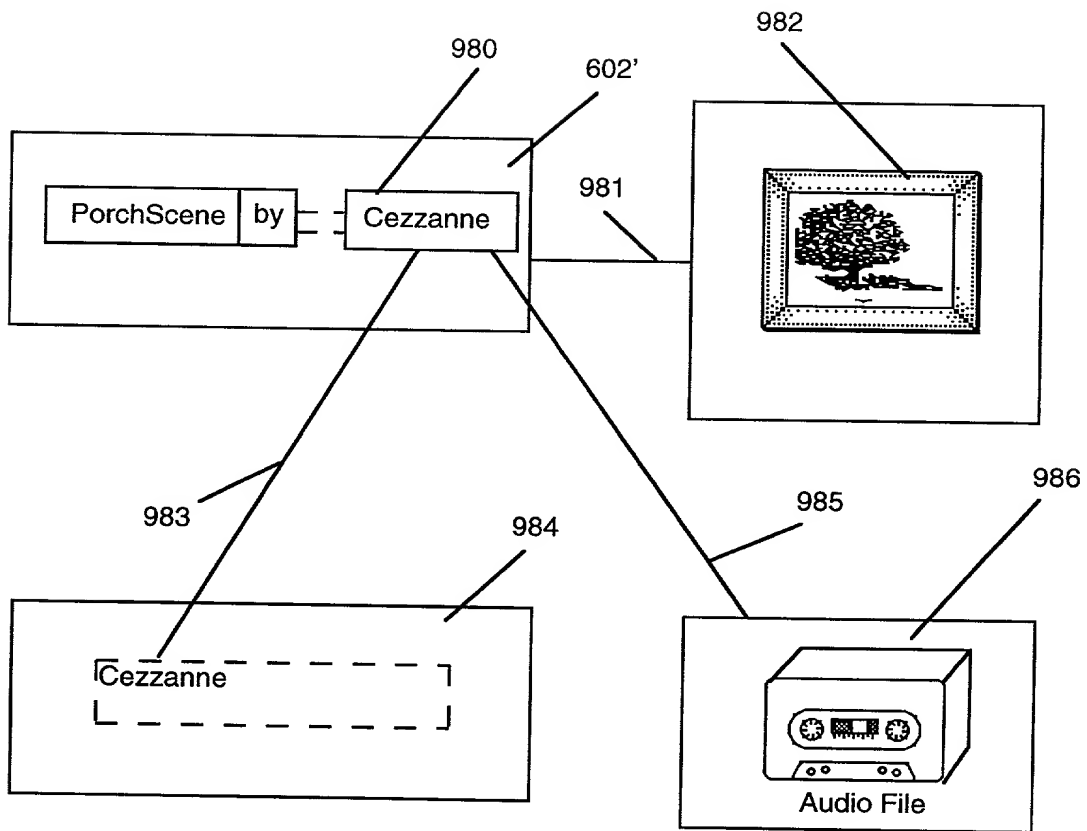


Fig. 23

Fig. 24

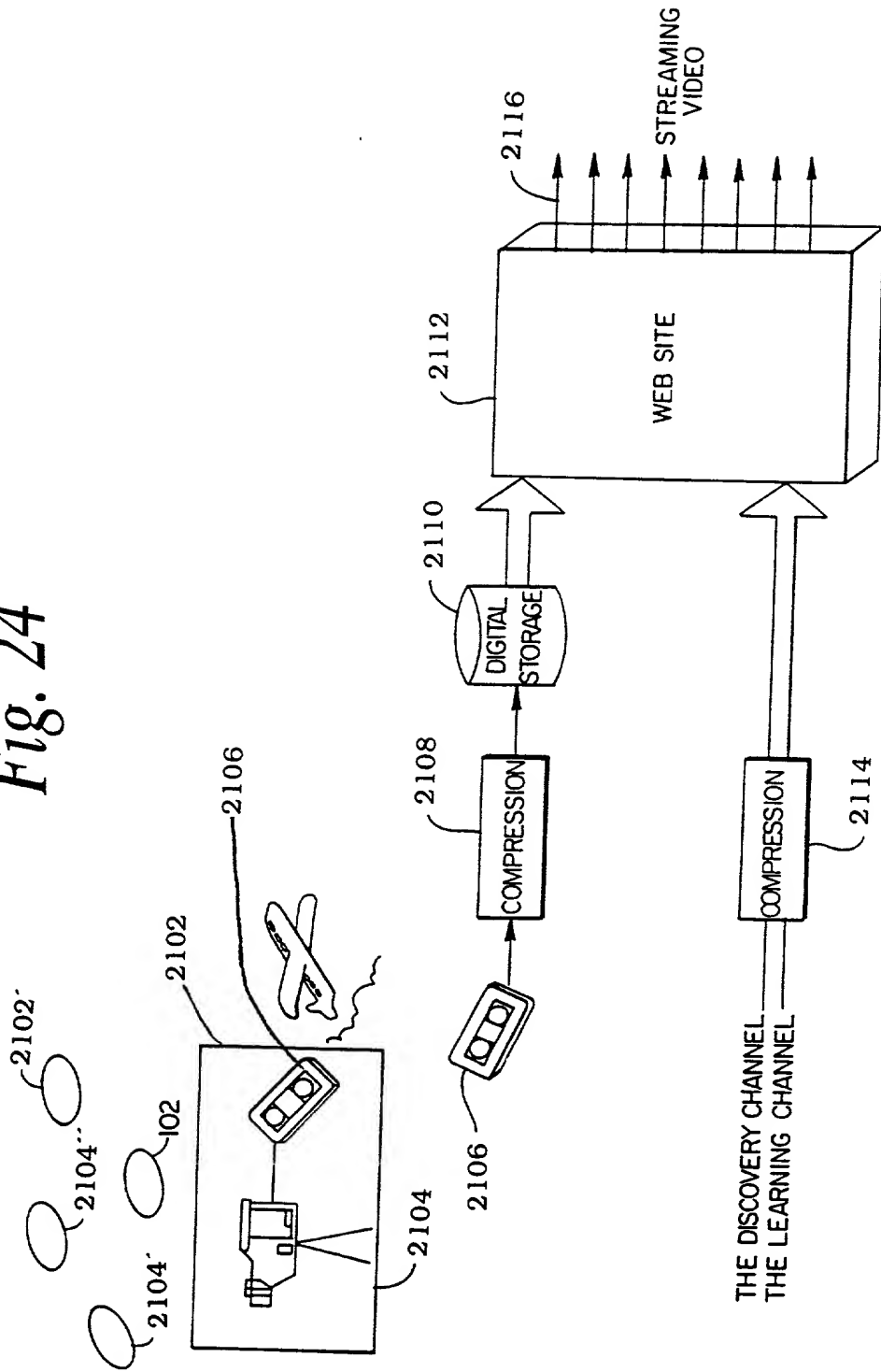


Fig. 25

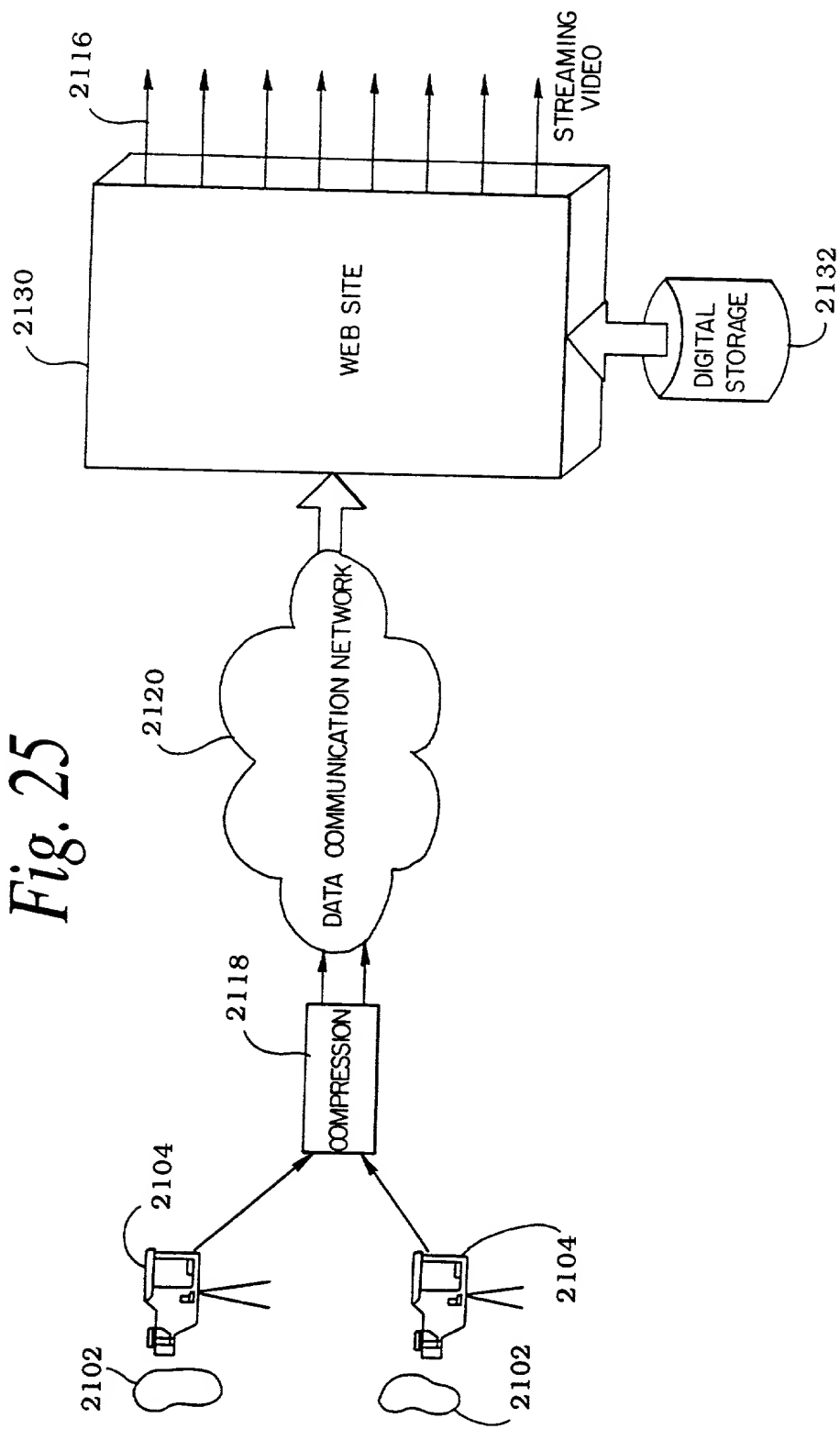


Fig. 26a

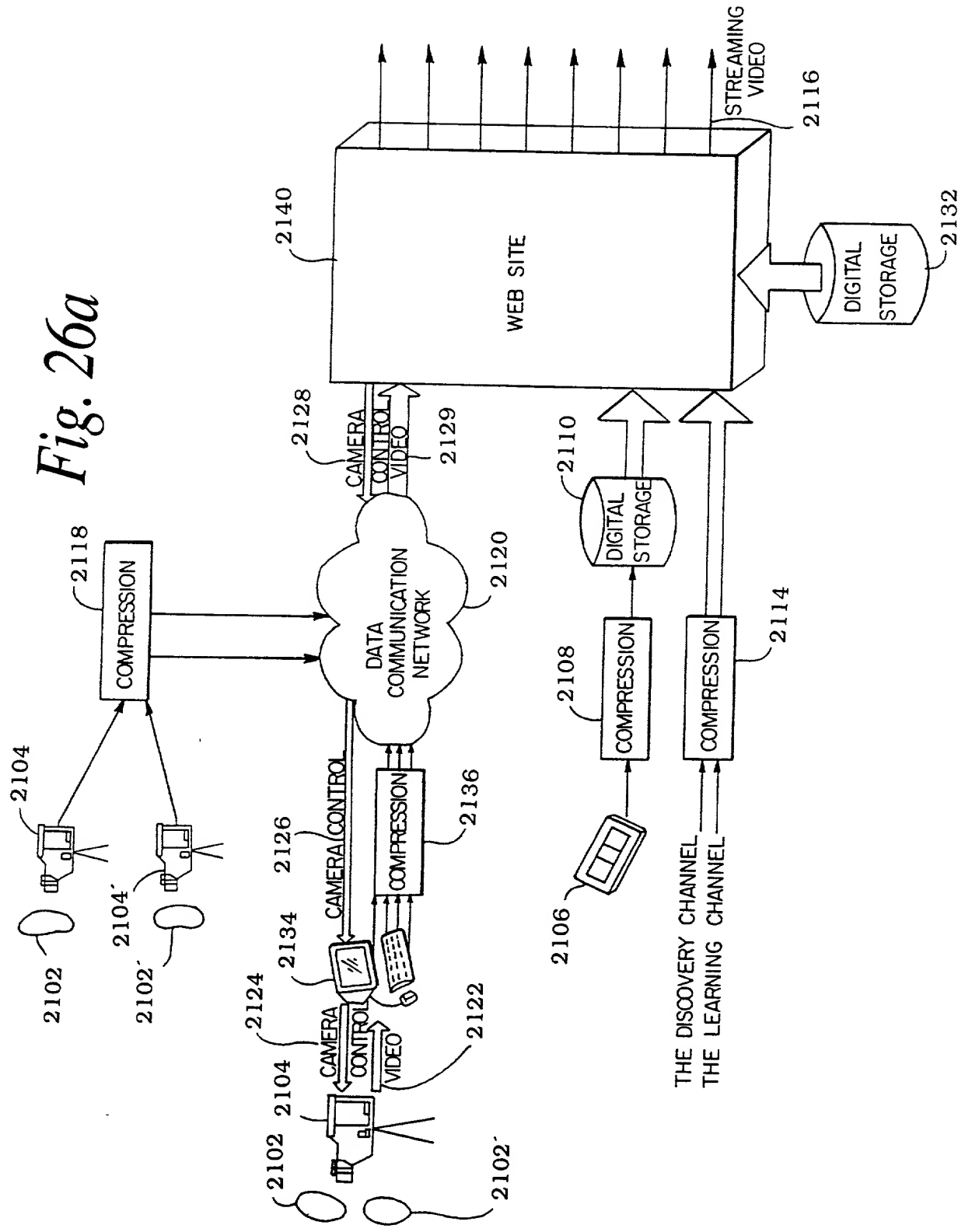


Fig. 26b

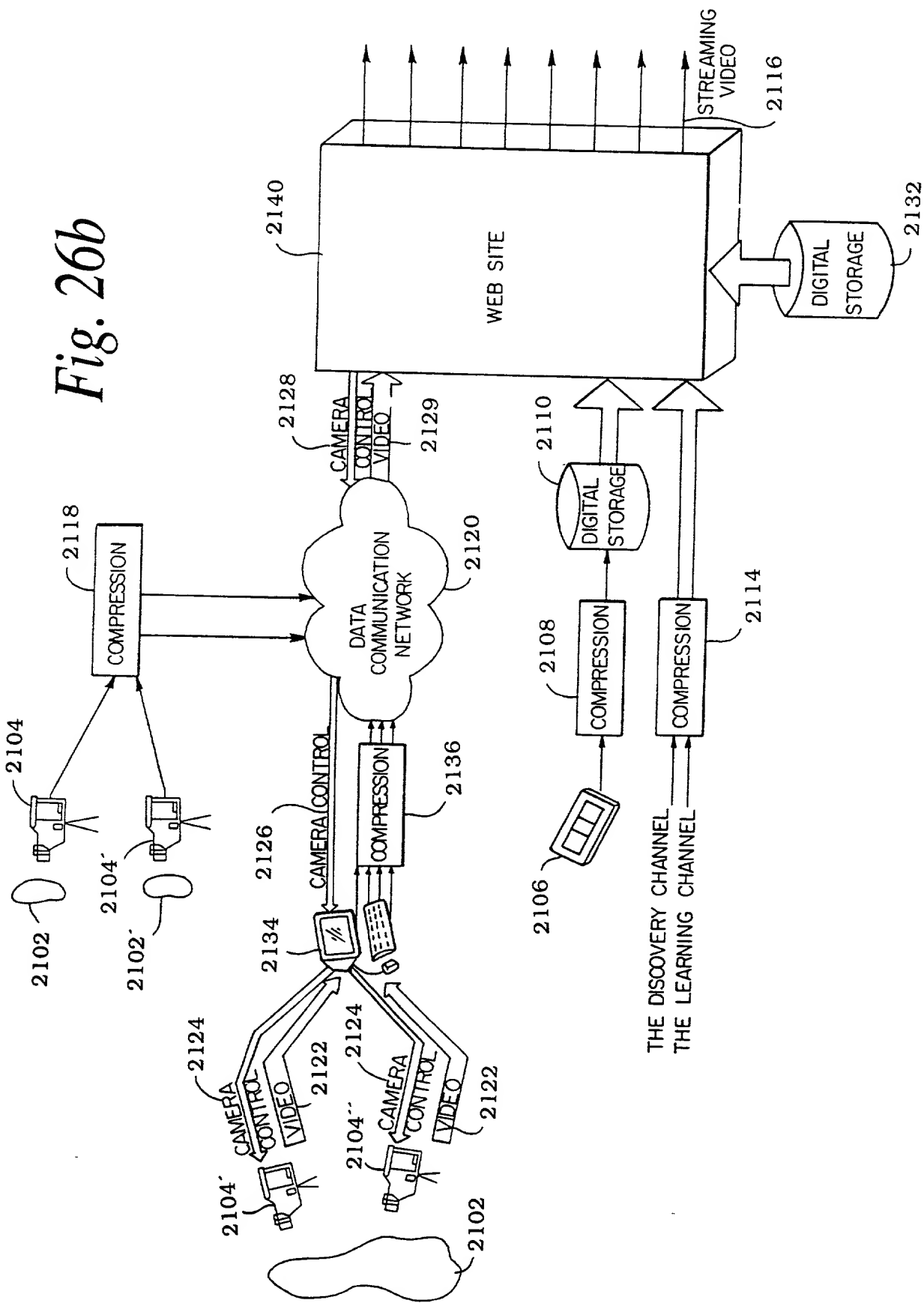


Fig. 27

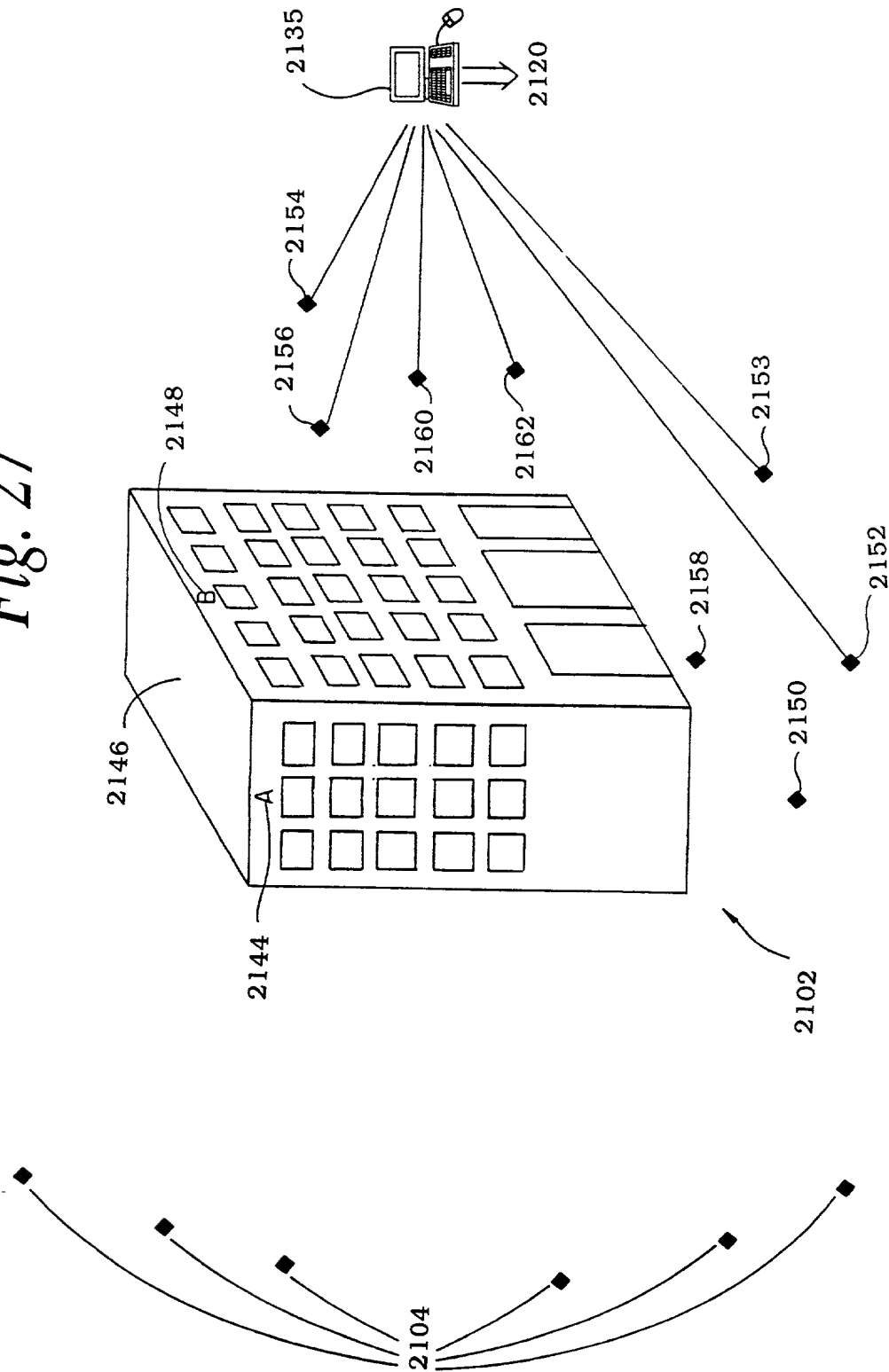


Fig. 28a

VIDEO CAMERA 2150

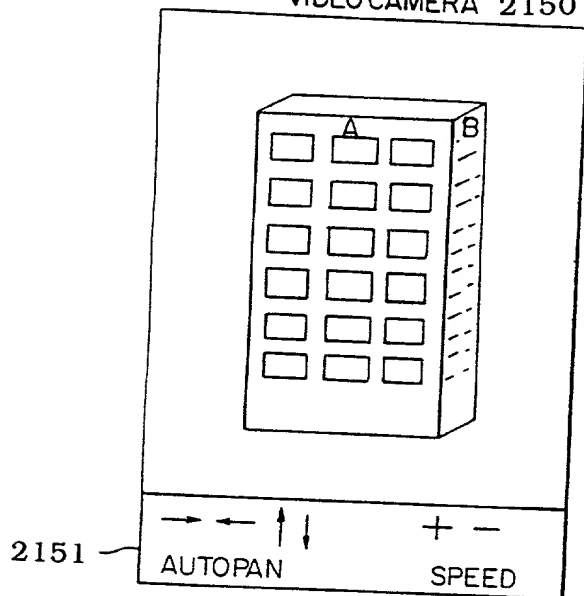


Fig. 28b

VIDEO CAMERA 2152

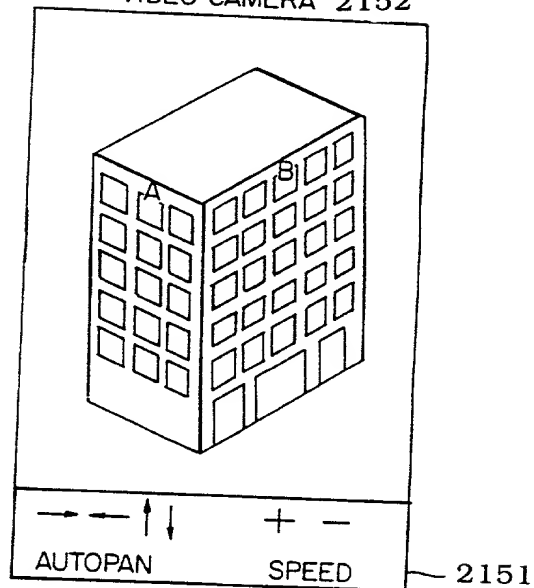


Fig. 28c

VIDEO CAMERA 2153

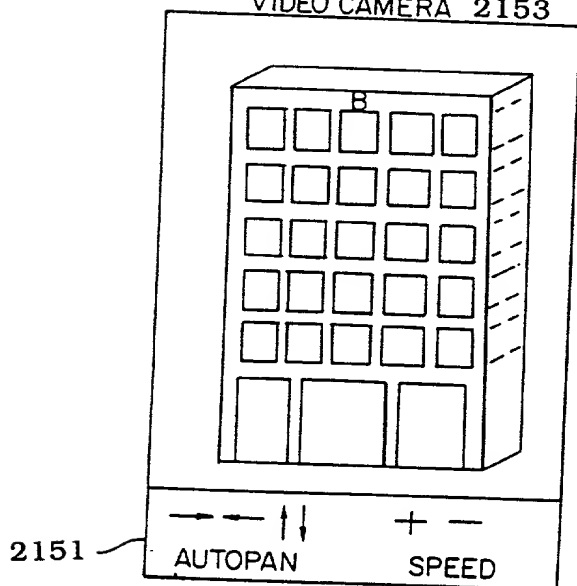


Fig. 28d

VIDEO CAMERA 2156

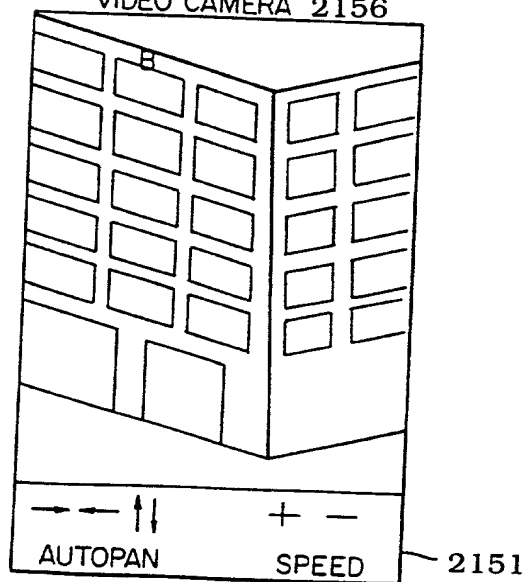


Fig. 29

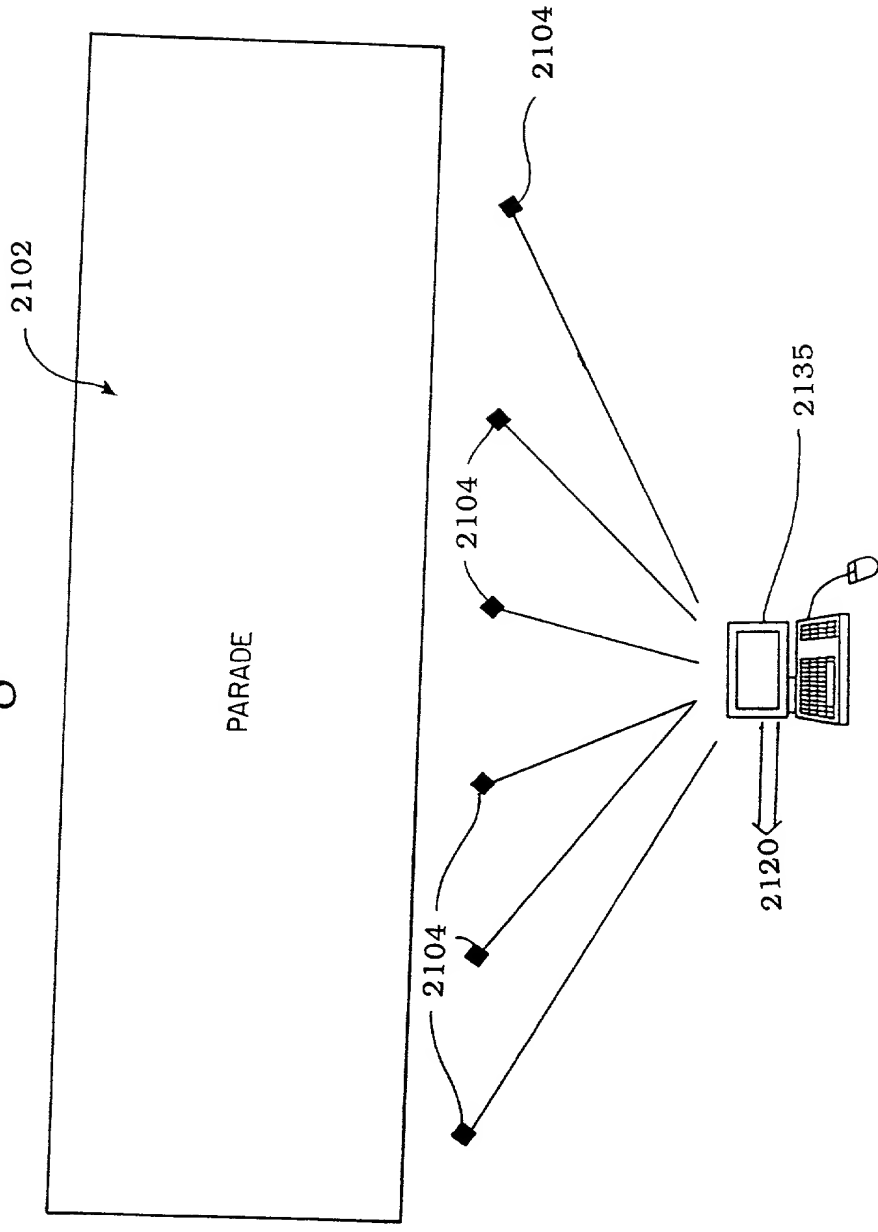


Fig. 30a

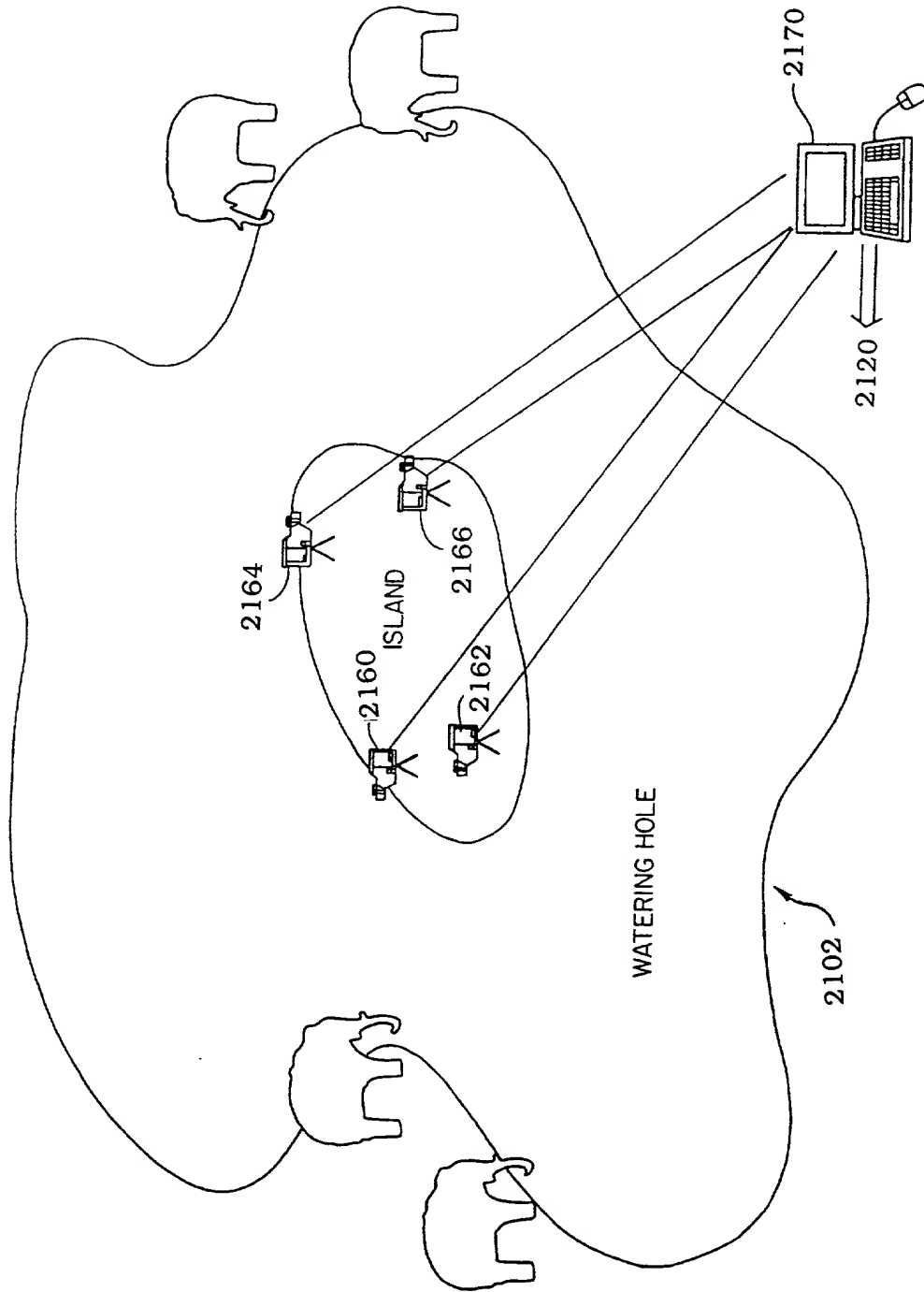


Fig. 30b

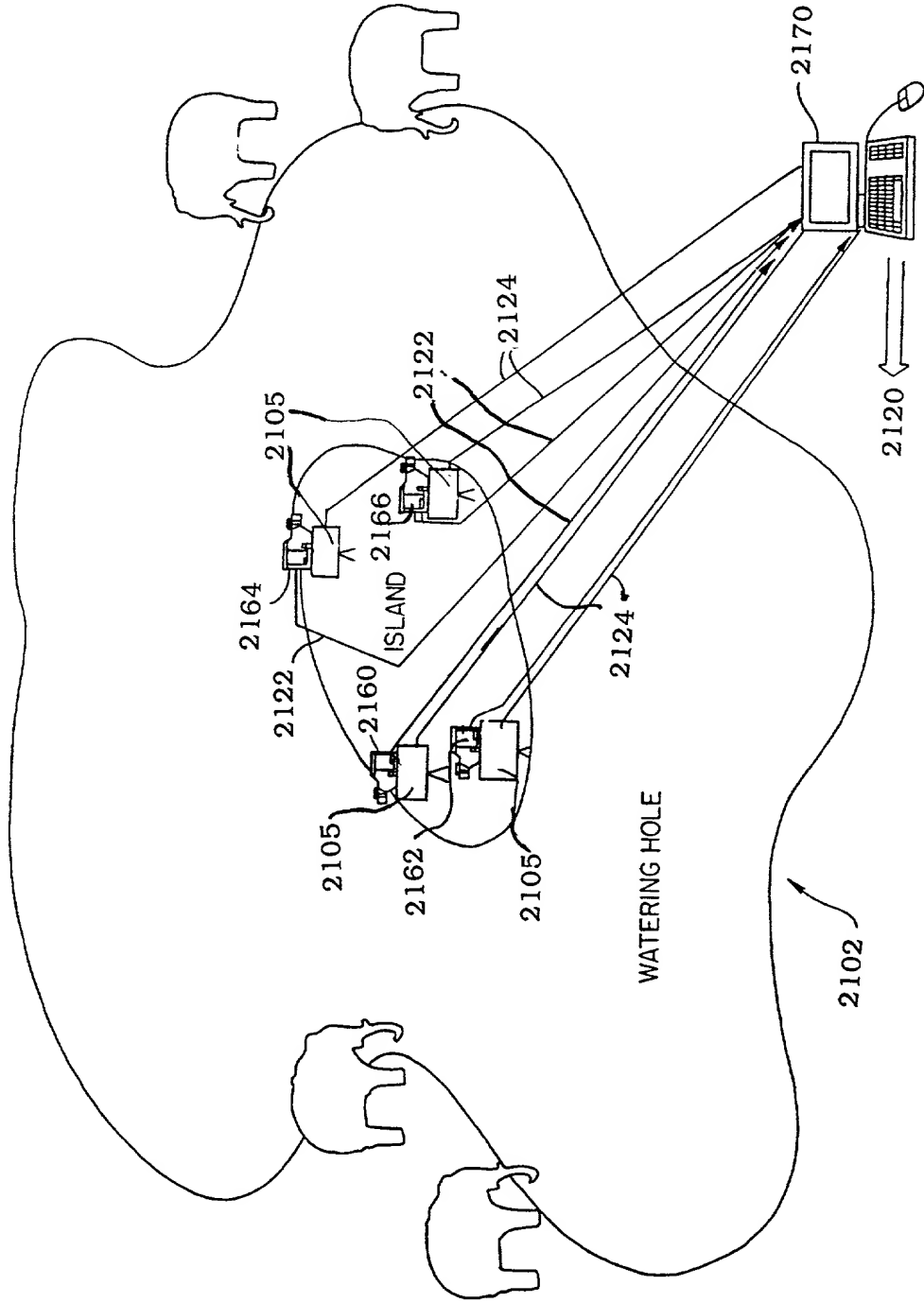


Fig. 31a

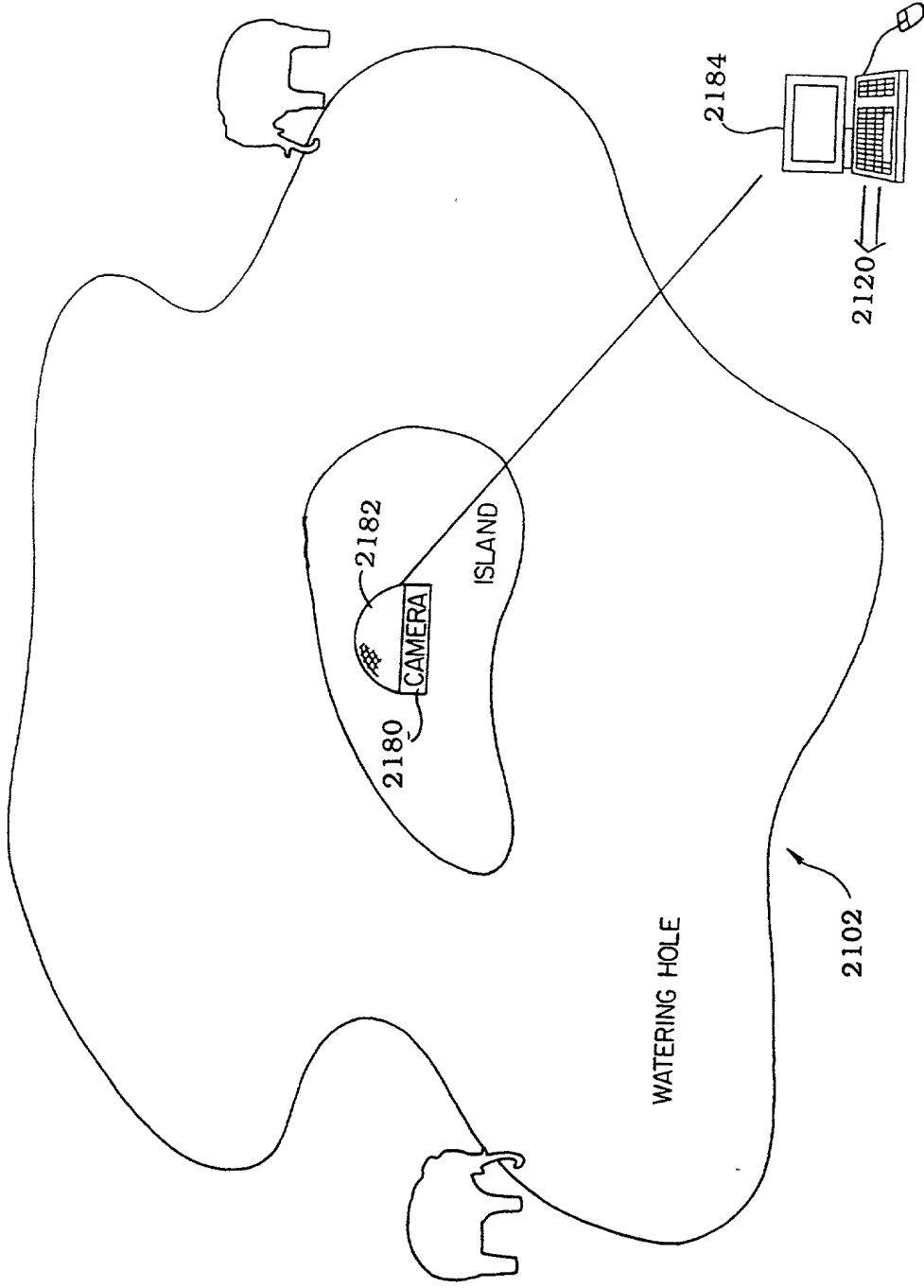
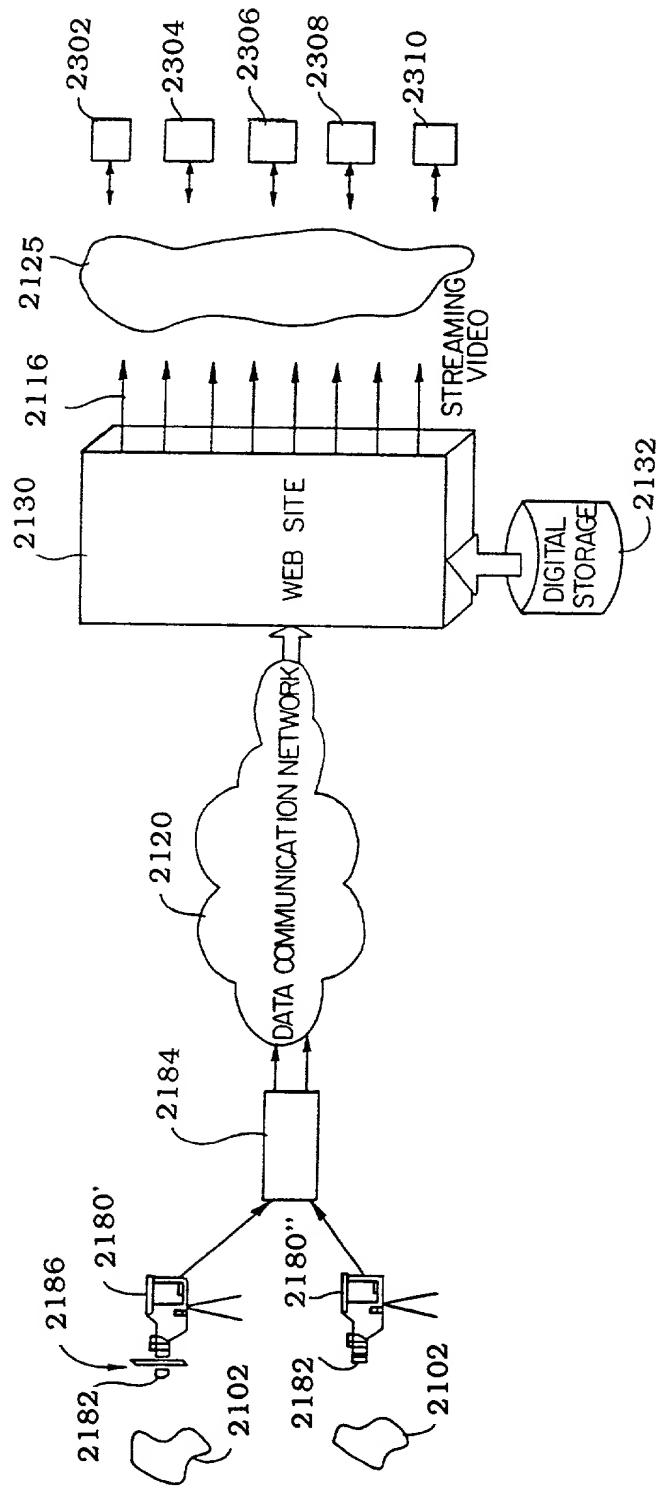


Fig. 31b



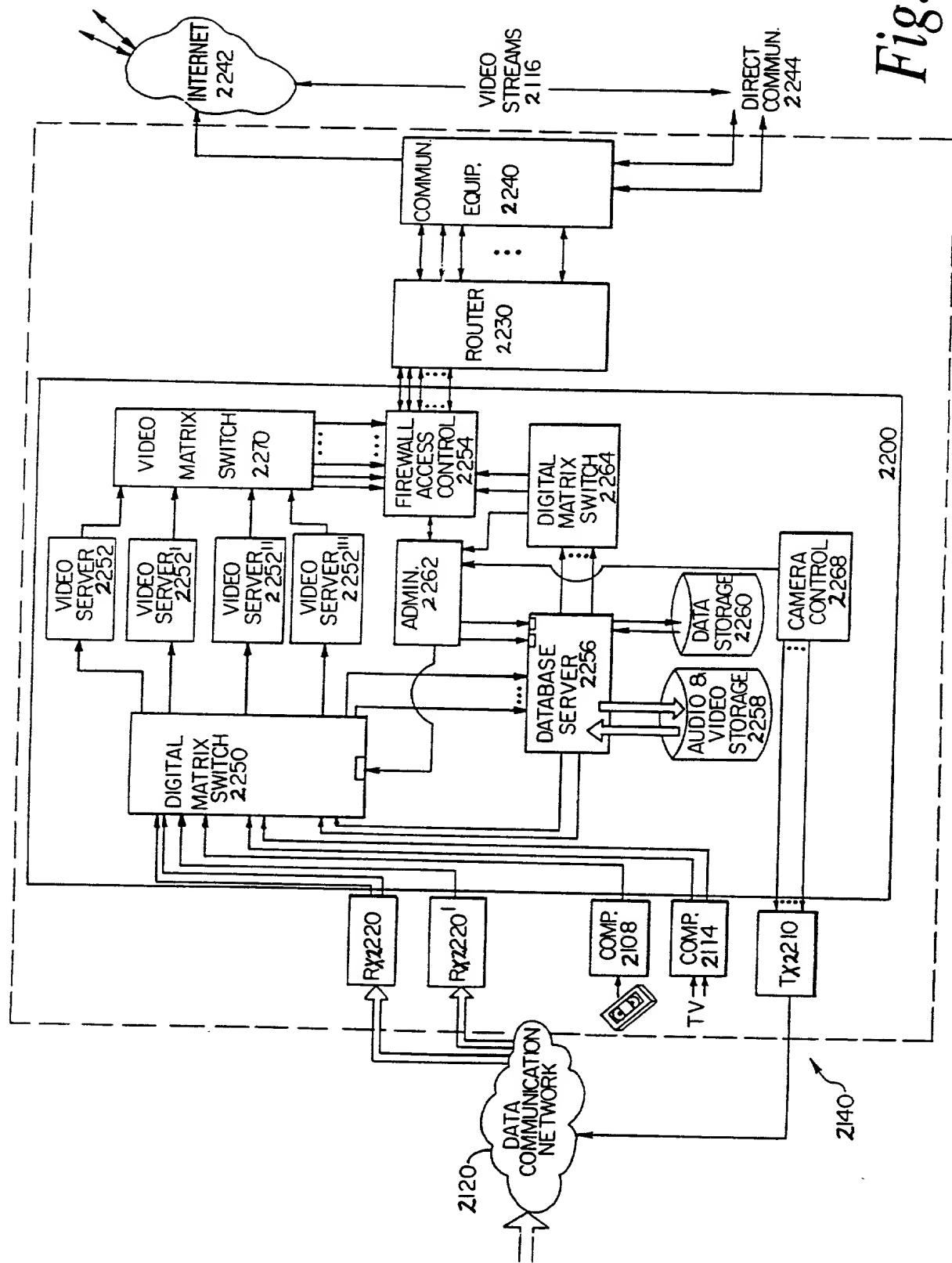
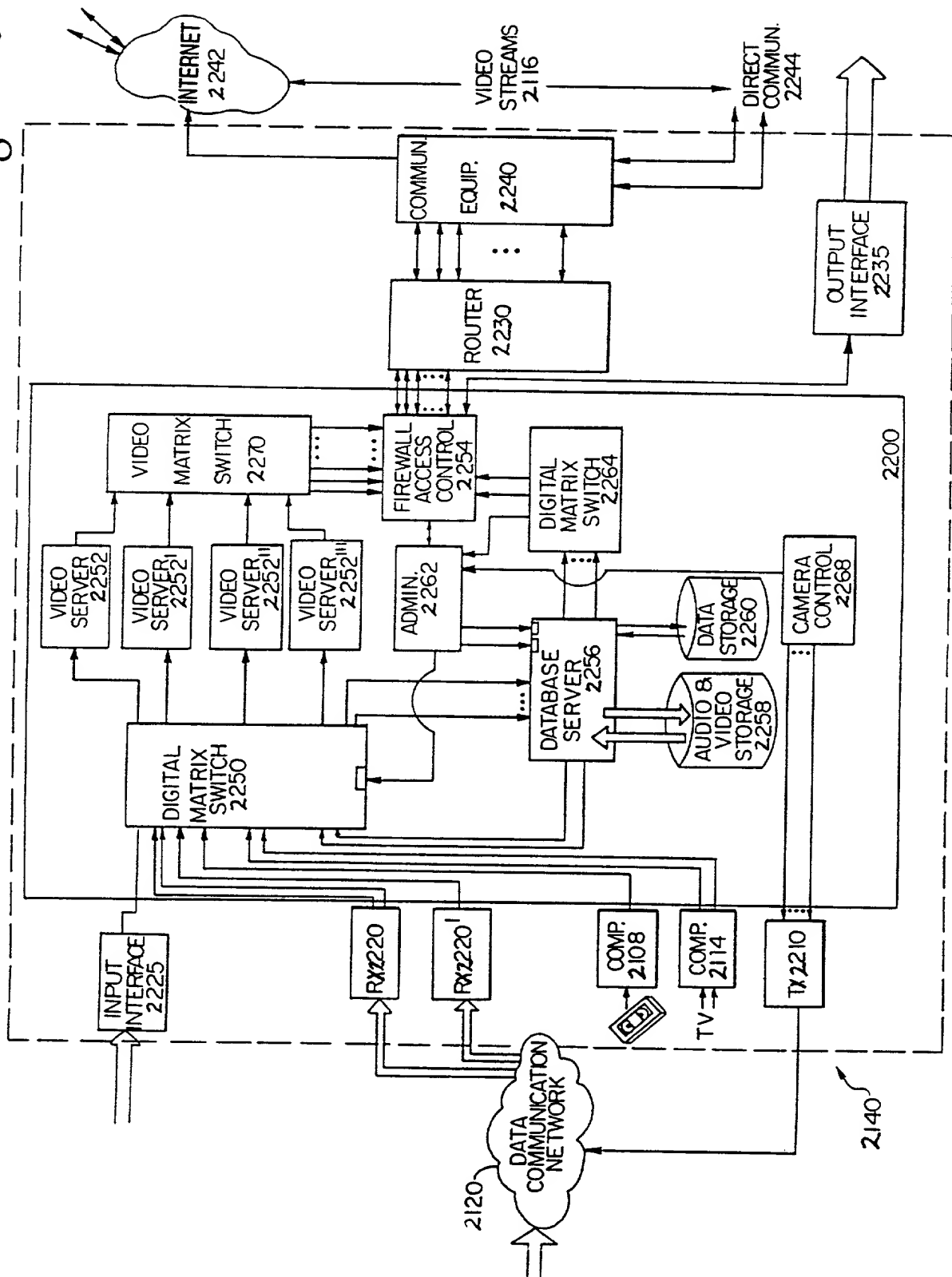


Fig. 32a

Fig. 32b



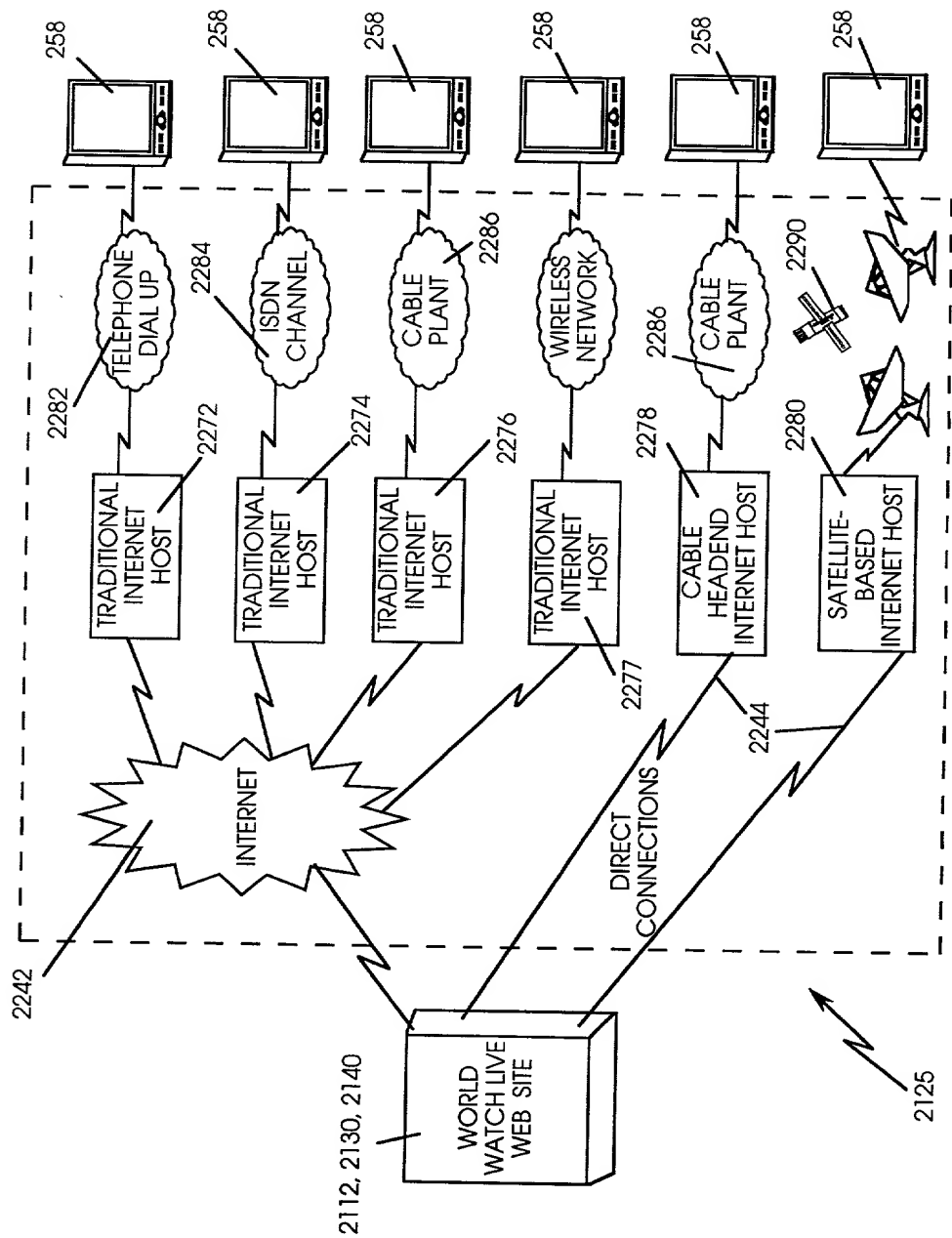


Fig. 33

Fig. 34

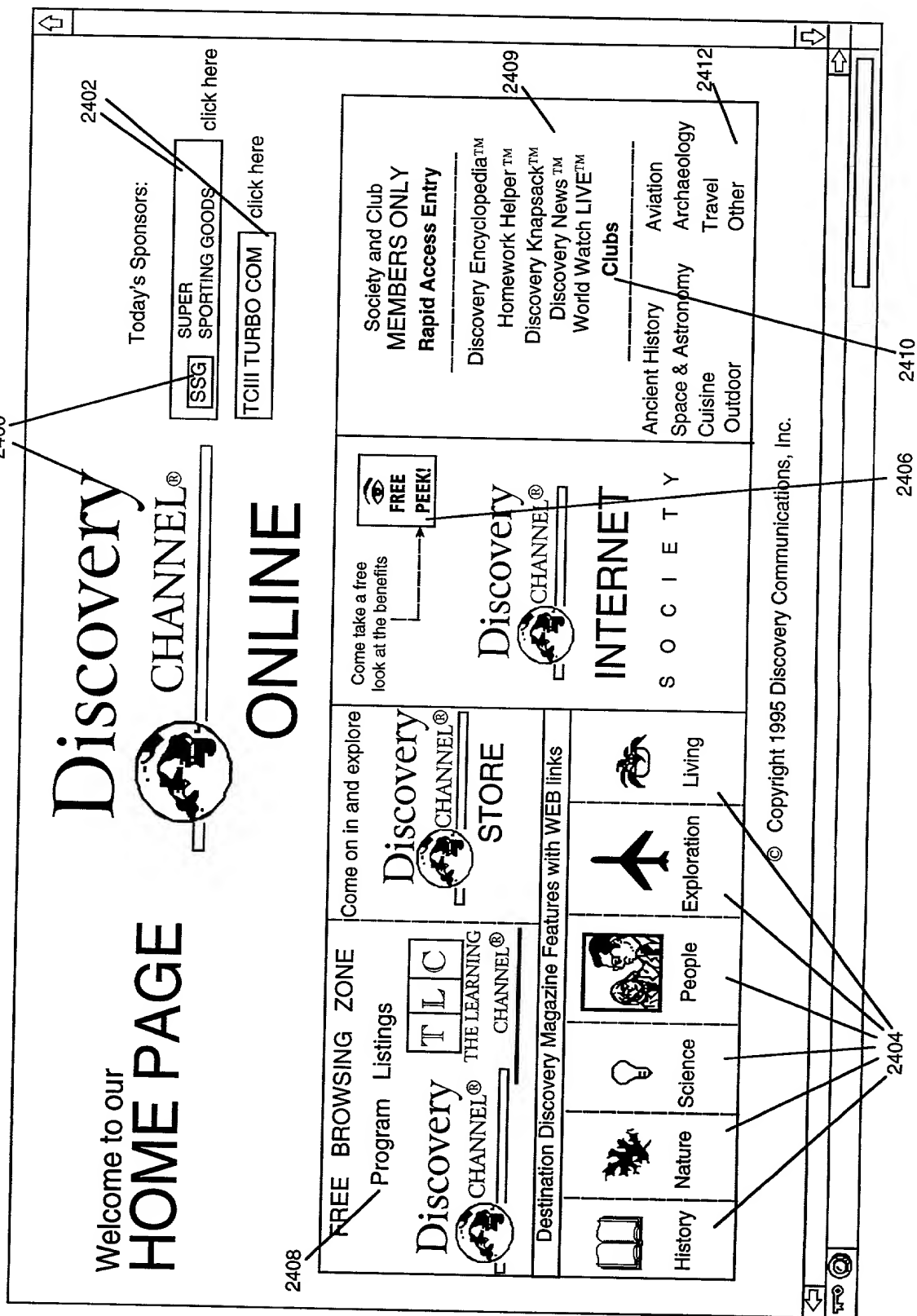


Fig. 36

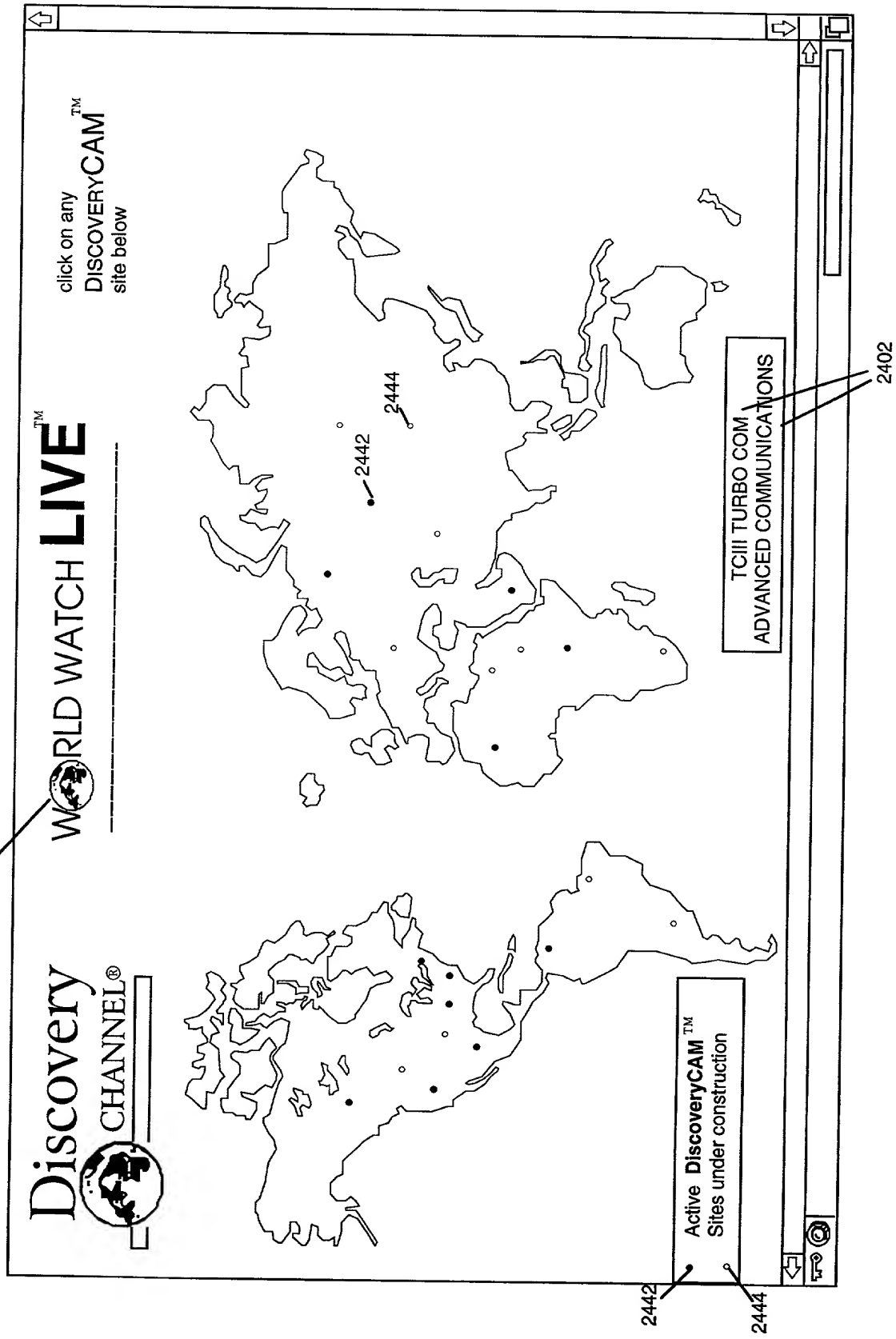


Fig. 37

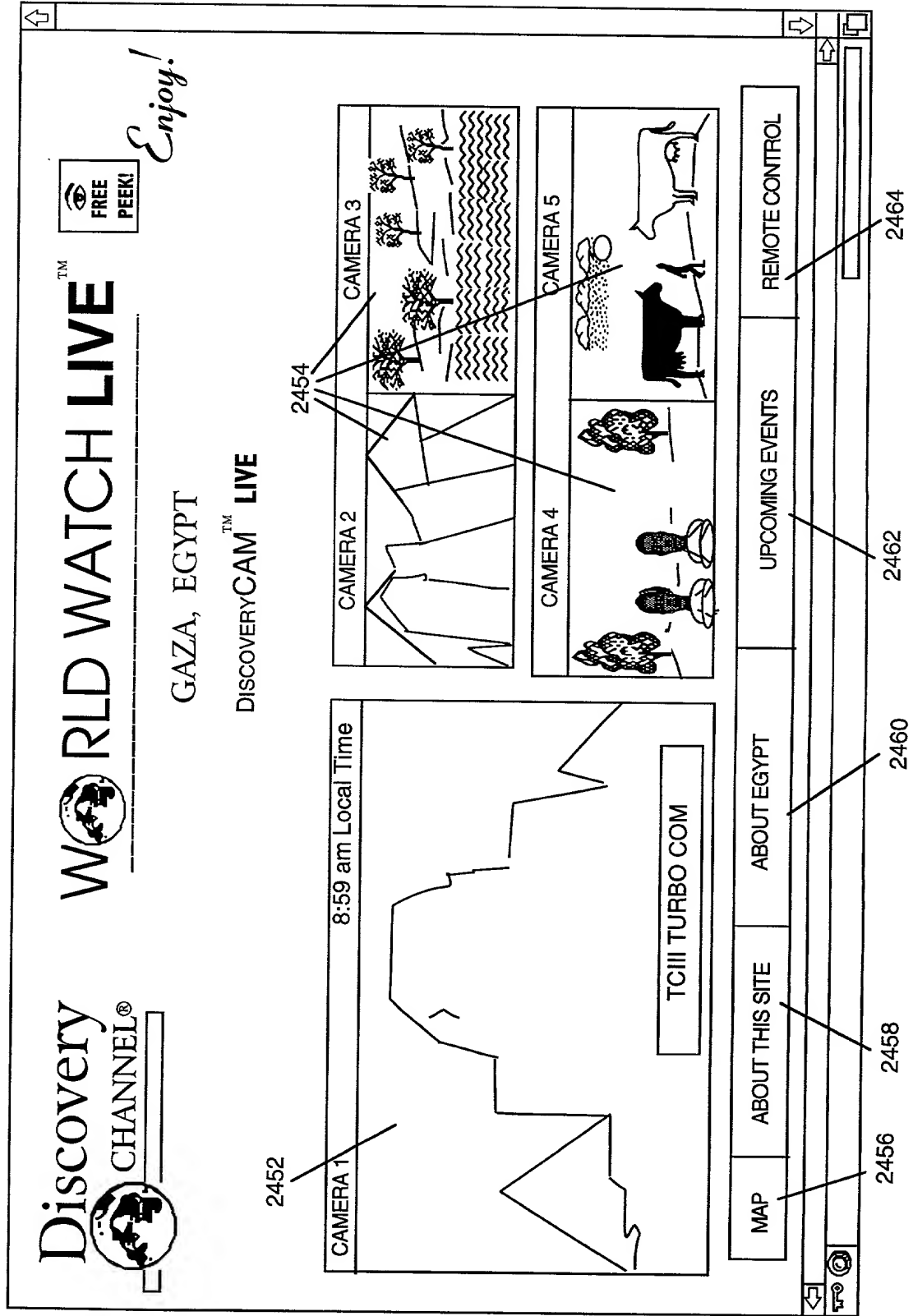


Fig. 38

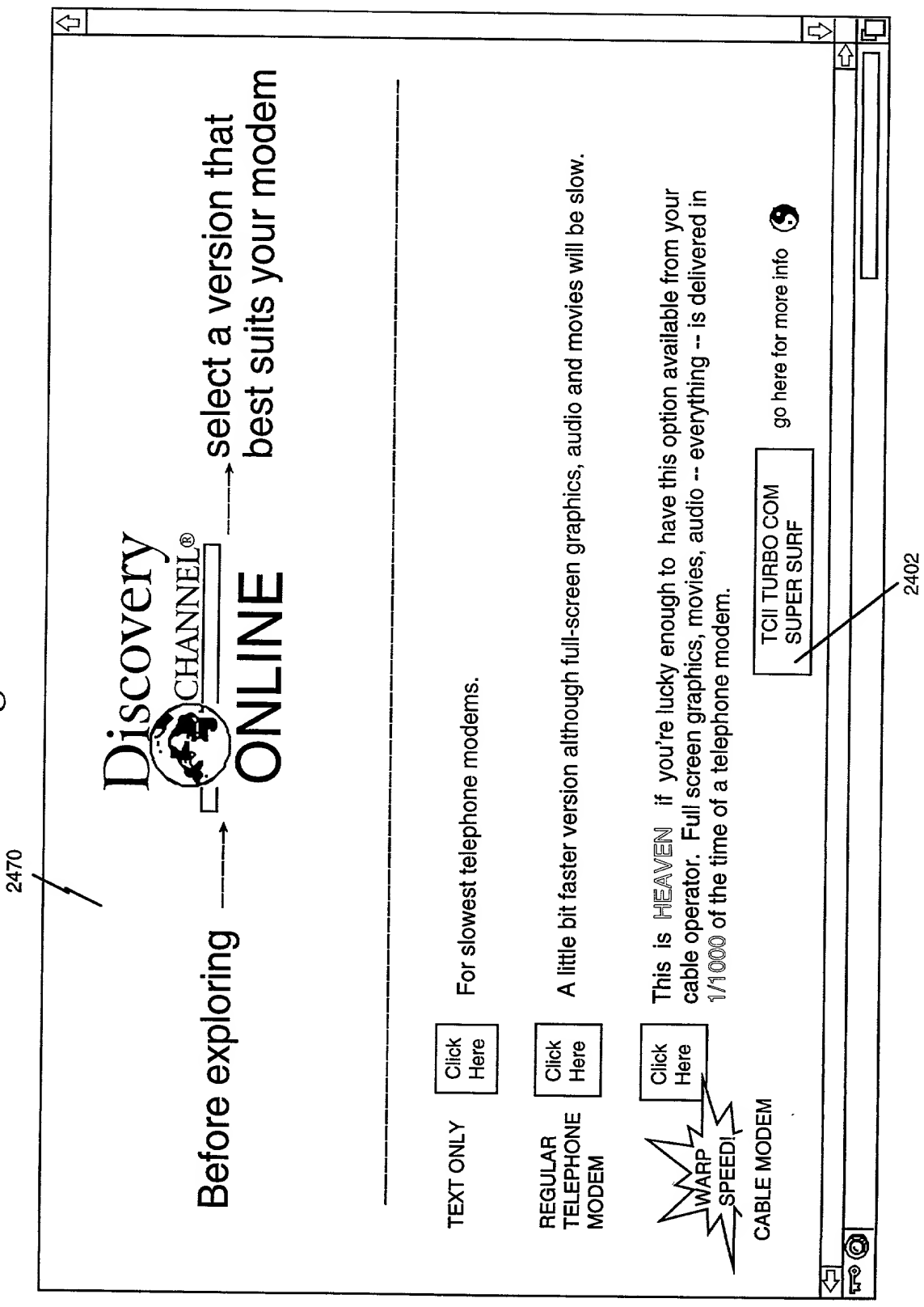


Fig. 39

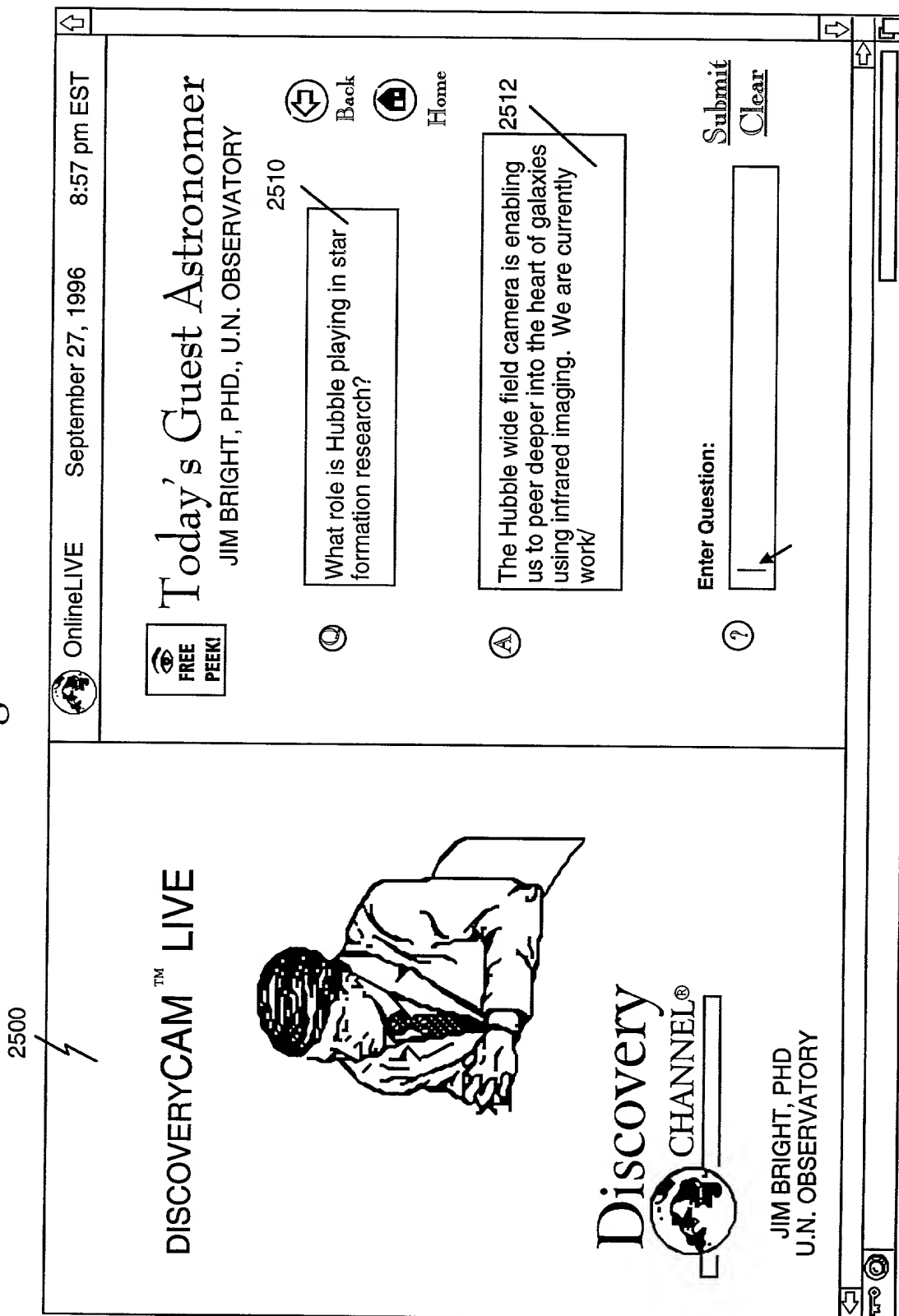


Fig. 40

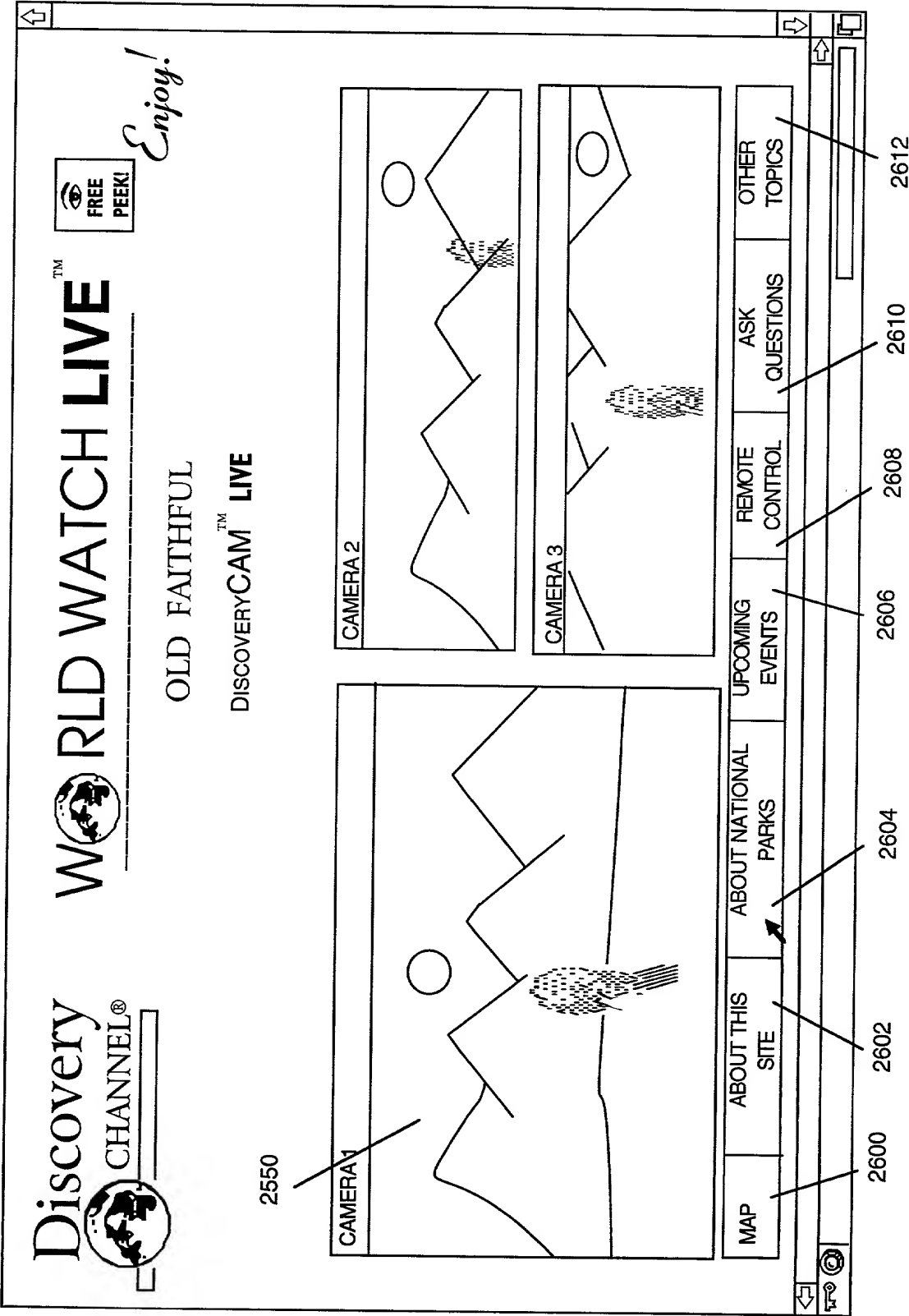
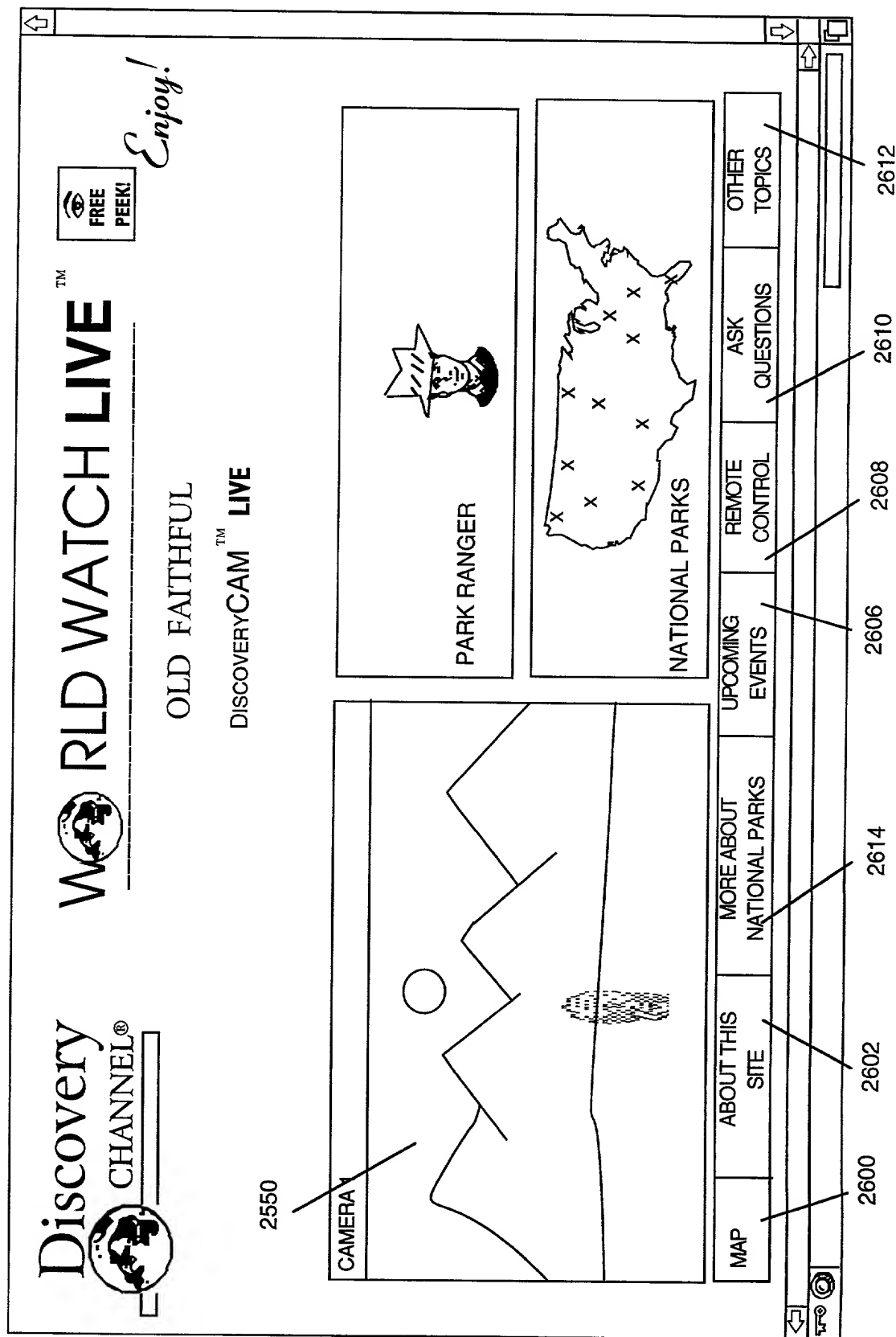


Fig. 41



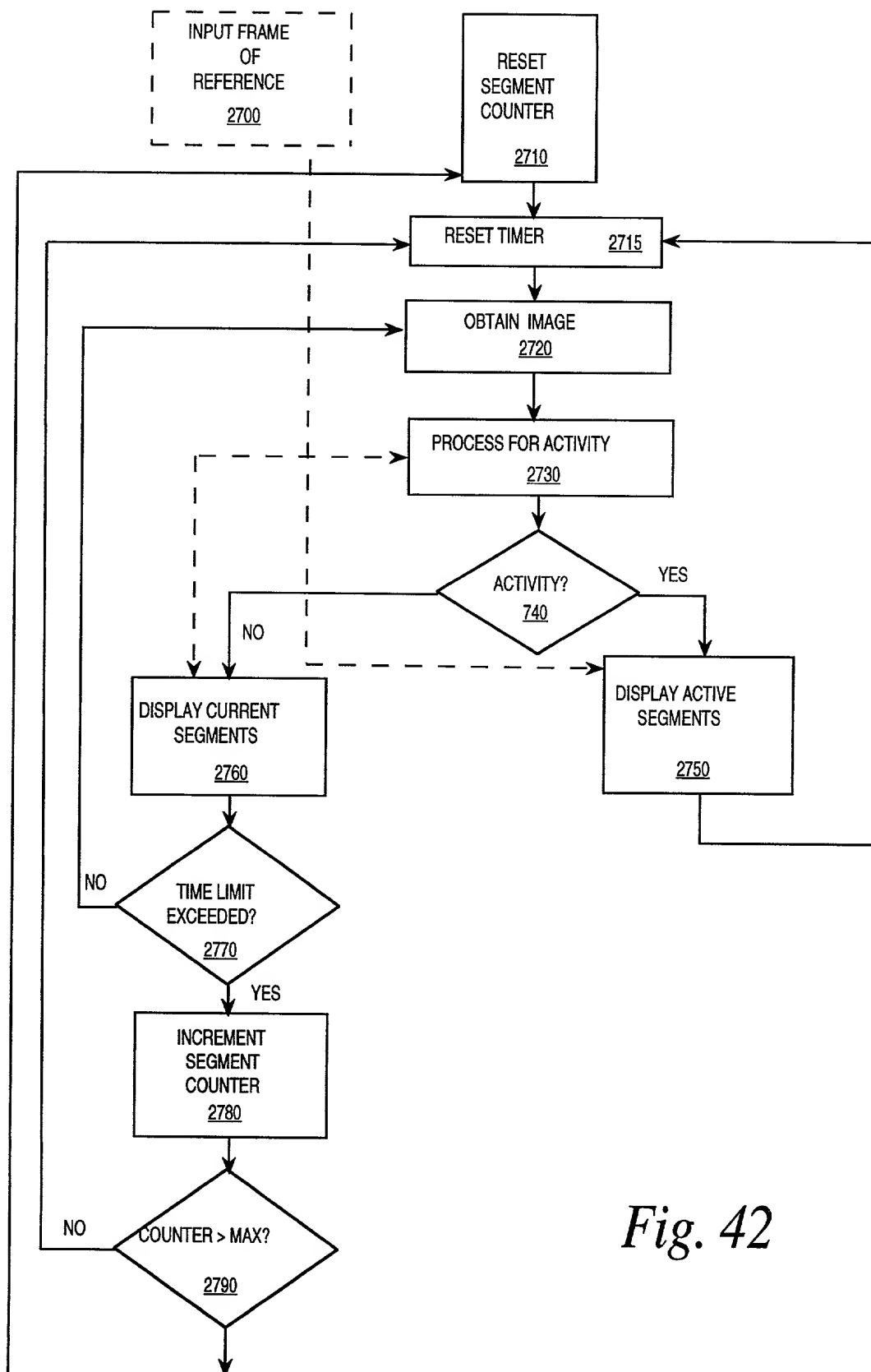
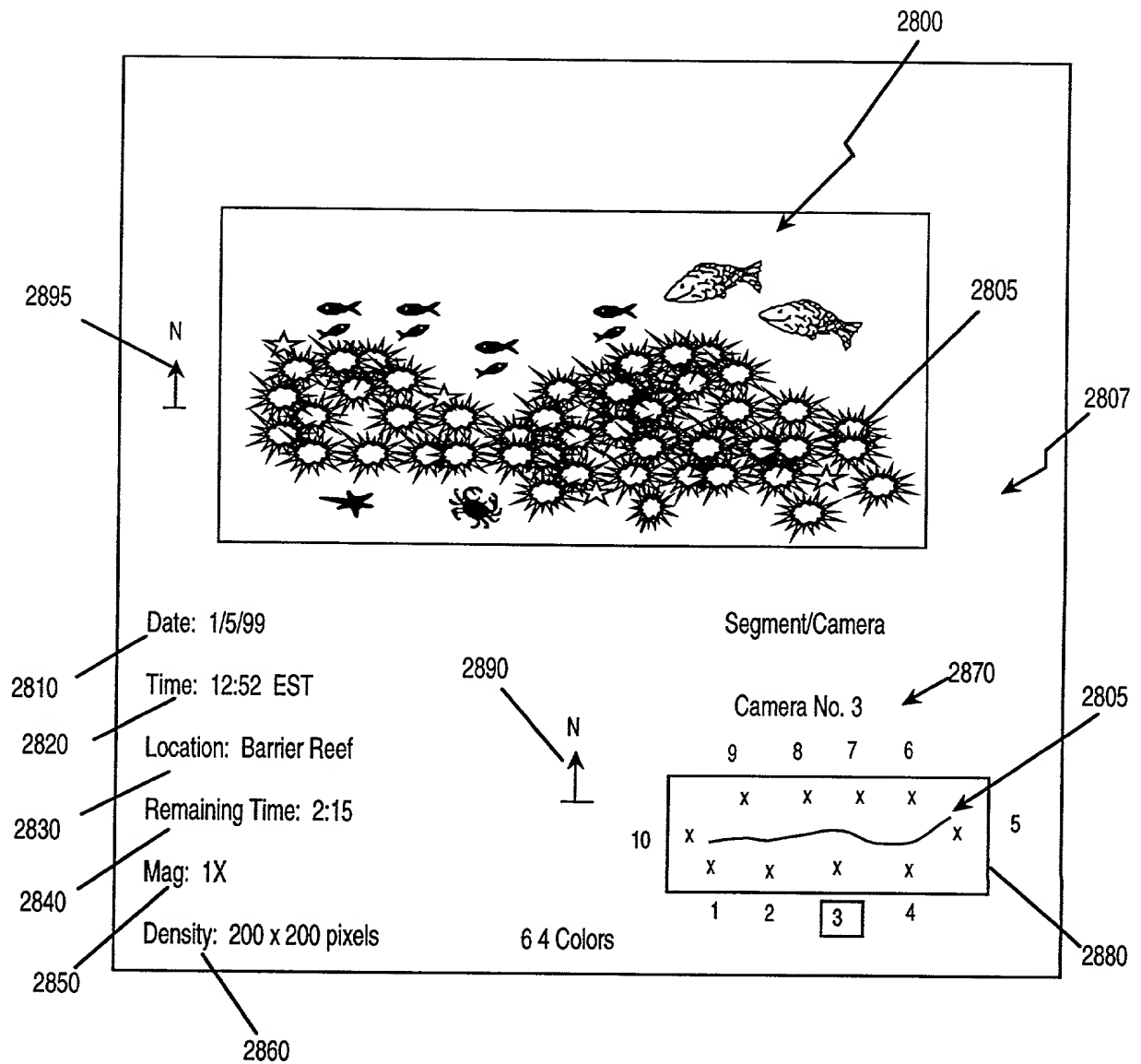


Fig. 42

Fig. 43



Docket No.

5281

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

ELECTRONIC BOOK CONNECTION TO WORLD WATCH LIVE

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International Application Number _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

_____ (Application Serial No.)	_____ (Filing Date)
_____ (Application Serial No.)	_____ (Filing Date)
_____ (Application Serial No.)	_____ (Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

07/991,074 _____ (Application Serial No.)	December 9, 1992 _____ (Filing Date)	Pending _____ (Status) (patented, pending, abandoned)
08/336,247 _____ (Application Serial No.)	November 7, 1994 _____ (Filing Date)	Patented _____ (Status) (patented, pending, abandoned)
08/160,194 _____ (Application Serial No.)	December 2, 1993 _____ (Filing Date)	Patented _____ (Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

_____ (Application Serial No.)	_____ (Filing Date)
_____ (Application Serial No.)	_____ (Filing Date)
_____ (Application Serial No.)	_____ (Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

08/906,569 _____ (Application Serial No.)	August 5, 1997 _____ (Filing Date)	Pending _____ (Status) (patented, pending, abandoned)
09/191,520 _____ (Application Serial No.)	November 13, 1998 _____ (Filing Date)	Pending _____ (Status) (patented, pending, abandoned)
08/923,091 _____ (Application Serial No.)	September 4, 1997 _____ (Filing Date)	Pending _____ (Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

09/237,827

January 27, 1999

Pending

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

09/237,828

January 27, 1999

Pending

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

09/391,461

September 8, 1999

Pending

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

_____	_____
(Application Serial No.)	(Filing Date)
_____	_____
(Application Serial No.)	(Filing Date)
_____	_____
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

09/289,956	April 13, 1999	Pending
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

Noto, Aldo, Reg. No. 35,628

Harrop, John K., Reg. No. 41,817

Ryan, John W., Reg. No. 33,771

Clark, W. Robinson H., Reg. No. 41,530

Shah, Ami P., Reg. No. 41,143

Wooden, Sean S., Reg. No. 43,997

Vietzke, Lance L., Reg. No. 36,708

Phillips, Matthew C., Reg. No. 43,403

McWhinney, Christopher, Reg. No. 42,875

Send Correspondence to: **John K. Harrop, Reg. No. 41,817**
DORSEY & WHITNEY LLP
1001 Pennsylvania Avenue, N.W., Suite 300 South
Washington, D.C. 20004

Direct Telephone Calls to: *(name and telephone number)*
John K. Harrop, Reg. No. 41,817 (202) 824-8821

Full name of sole or first inventor HENDRICKS, John S.	
Sole or first inventor's signature	Date
Residence Montgomery County, MD 10854	
Citizenship US	
Post Office Address 8723 Persimmon Tree Road, Potomac, MD 20854	

Full name of second inventor, if any McCOSKEY, John S.	
Second inventor's signature	Date
Residence Douglas County, CO 80104	
Citizenship US	
Post Office Address 4692 N. Lariat Drive, Castle Rock, CO 80104	

Full name of third inventor, if any ASMUSSEN, Michael L.	
Third inventor's signature	Date
Residence Fairfax County, VA 20171	
Citizenship US	
Post Office Address 2627 Meadow Hall Drive, Herndon, VA 20171	

Full name of fourth inventor, if any	
Fourth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of fifth inventor, if any	
Fifth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Full name of sixth inventor, if any	
Sixth inventor's signature	Date
Residence	
Citizenship	
Post Office Address	